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ABSTRACT

This document presents the Health Professions Education Master Plan, a part of Phase III of the New Jersey Master Plan for Higher Education. The Plan covers (1) team concept of health care delivery and the education of health professionals; (2) accreditation, licensure and certification: factors affecting manpower availability; (3) recruitment, retention and mobility; (4) continuing education; (5) regionalization and institutional cooperation; (6) use of health facilities resources; (7) faculty preparation and development; (8) research in the health sciences; (9) manpower needs in the occupational categories; (10) implementation of the Master Plan; and (11) evaluation and review of the Master Plan. Appendices include advisory committee members, major meetings, advisory council members, and inventory of health professions education programs. (MJM)

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Health Professions Education Master Plan

A part of phase III of the New Jersey Master Plan for Higher Education

May 1973

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For assistance on specific aspects of the study, we are grateful to:

Chapter II, Team Concept -- Stanley S. Bergen, Jr., M.D., President, CMDNJ; Coralie Farlee, Ph.D., Assistant Director, Office of Health Professions Education, DHE.

Chapter III, Accreditation, Licensure and Certification -- Michael Bernstein,L.I.U.; Alan Decker, Richard Stockton State College; Hildegarde Peplau, Ed.D., Rutgers University College of Nursing; Henry Winkler, Ph.D., Senior Vice President for Academic Affairs, Rutgers University.

Chapter V, Continuing Education -- Marvin Greenberg, Vice President and Harry S. Layton, Director, Bureau of Continuing Professional Education, Rutgers University.

Chapter VI, Regionalization and Institutional Cooperation -- Alvin Florin, M.D.,Coordinator, and Marie Del Guercio, Associate Coordinator, N.J. Regional Medical Program; Kenneth Paisley, Comprehensive Health Planning Division, Department of Health,and Ernest Lynton, Ph.D., Dean of Livingston College, and his colleagues on the Rutgers University Health Science

Committee, on interrelationships with "B" Agency Manpower Subcommittees and the development of health professions education consortia; Dean Genia Berk, Union County Technical Institute and Alan Decker on "Institutional Sharing of Resources"; Charles Vevier, Ph.D., Executive Vice President, CMDNJ, on the role of that institution in health professions education.

Chapter VII, Use of Health Facilities Resources - Rose Channing, Director of Health Technologies, Middlesex County College.

Chapter VIII, Faculty Preparation -- Shirley Smoyak, Ph.D., Rutgers University College of Nursing.

Chapter IX, Research in the Health Sciences -- Hans Fischer, Ph.D., Rutgers University, Charles Vevier and Coralie Farlee.

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Physicians-- Stanley S. Bergen, Jr., M.D.

Physician's Assistants -- Michael Bernstein, and Ted Marton, Richard Stockton State College.

Professional Nurses -- Suzanne Hawes, Office of Health Professions Education and formerly Director, Charles E. Gregory School of Nursing. A conference held on April 25 with members of the N.J. League for Nursing and the N.J. State Nurses Association resulted in much constructive revision of an earlier version of this section of the study, and we are grateful to the organizers and participants in that meeting, particularly Barbara Wright.

Dental Health Personnel -- John Eisner, D.D.S., Assistant to the Dean, N.J. Dental School-CMDNJ.

Pharmacists -- Roy Bowers, Ph.D., Dean, Rutgers College of Pharmacy.

Veterinarians -- David Tudor, V.M.D., Rutgers University.

Chapter XI, *Implementation* -- John Eisner

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Above all, my thanks to Commissioner James Cowan, M.D., New Jersey Department of Health, and Alvin Florin of the RMP for the financial support and encouragement their organizations provided to assist in the preparation of this plan, and to Chancellor Ralph A. Dungan for authorizing us to proceed, and his sympathetic understanding during the entire process in the preparation of this document.

Edward Cohen, Director
Office of Health Professions Education
N.J. Department of Higher Education

GLOSSARY

"A" Agency	Statewide Coordinating Body Comprehensive Health Planning Agency as designated by Public Law 89-749, Section 314a.
AAS	Associate in Applied Science
ADA	American Dental Association American Dietetic Association
AHEC	Area Health Education Center
AMA	American Medical Association
"B" Agency	Area (regional within states) Coordinating Comprehensive Health Planning bodies as designated by Public Law 89-749, Section 314b.
BHE	Board of Higher Education
BHME	Bureau of Health Manpower Education (in NIH, DHEW)
CDA	Certified Dental Assistant
CHEN	Council for Higher Education in Newark
CHP	Comprehensive Health Planning (in the Department of Health)
CITT	Certified Inhalation Therapy Technician
CLA	Certified Laboratory Assistant
CMDNJ	College of Medicine and Dentistry of New Jersey
DDS	Doctor of Dental Surgery
DHE	Department of Higher Education (225 West State Street, Trenton, New Jersey)
DHEW	Department of Health, Education and Welfare (U.S. Government)
DMD	Doctor of Dental Medicine
FMG	Foreign Medical Graduates
FY	Fiscal Year
HEW	Health Education and Welfare (a Federal Department)
HHPC	Health and Hospitals Planning Council (Area II's "B" Agency in New Jersey)

GLOSSARY (Cont'd)

HMDP	Health Manpower Data Project (of The Department of Health, December 1971)
HMO	Health Maintenance Organization
HMOC	Health Manpower Occupational Category
HPEAC	Health Professions Education Advisory Council Advisory Body to the Department and Board of Higher Education (See Appendix C)
HPEMP	Health Professions Education Master Plan (A part of Phase III of the New Jersey Master Plan for Higher Education, Office of Health Professions Education, Department of Higher Education, Revised Draft, December, 1972)
HPEMP Advisory Committee	Advisory Committee to the Office of Health Professions Education for the Health Professions Education Master Plan (see Appendix A)
HRET	Hospital Research and Education Trust (a research affiliate of the Hospital Association)
HSMHA	Health Services and Mental Health Administration (DHEW)
LPN	Licensed Practical Nurse
MEDEX	Term used to identify ex Military Corpmen
MLT	Medical Laboratory Technician
NARD	National Association of Retail Druggist
NAS	National Academy of Sciences
NIH	National Institute of Health (in the Department of Health, Education and Welfare)
NJHA	N.J. Hospital Association
NJHCS	New Jersey Health Careers Service (see Chapter IV)
OHPE	Office of Health Professions Education (in the Department of Higher Education)
PA	Physician's Assistant
PHS	Public Health Service
POMR	Problem Oriented Medical Record

GLOSSARY (Cont'd)

RD	Registered Dietitian
RIT	Registered Inhalation Therapist
RMP	Regional Medical Program
RMPS	Regional Medical Program Services
SASHEP	Study of Accreditation of Selected Health Educational Programs
SUNY	State University of New York
TEAM	Training for Expanded Auxiliary Management (a federal program designed to train dental students to manage a team of auxiliaries)
USEC	Urban Science Education Coalition (see Chapter IV)
VMD	Doctor of Veterinary Medicine

SUMMARY OF RECOMMENDATIONS

CHAPTER II - TEAM CONCEPT OF HEALTH CARE DELIVERY AND THE EDUCATION OF HEALTH PROFESSIONALS

Recommendation #1 - Investigations should be made of the alternative structures of teams to determine optimum ways in which the team approach can be integrated into the educational process. In cooperation with health occupations educators and practitioners, the Department and HPEAC should develop the following specific position papers to animate and be adopted, where indicated, by our health professions programs:

A. How the introduction of the team health care concept changes the traditional hierarchical structure of medical and dental practice, harboring potential for improved patient service, while also potentially introducing certain new limitations and problems.

B. The functions and methods of initiating health care teams: the experience and composition of existent team efforts; identification of new possibilities for health care team activity.

C. Explicit methods for training health professionals in group process and interprofessional care, which presumably must result in a reworking of some of our present educational objectives.

Recommendation #2 - The dental educators, both professional and auxiliary, within the State begin to develop, with professional consultation and support, appropriate educational programs which will demonstrate the dental team concept as an integral part of each dental professional's training.

CHAPTER III - ACCREDITATION, LICENSURE AND CERTIFICATION: factors affecting manpower availability

Recommendation #1 - The HPEAC should examine and recommend to the Chancellor and Board of Higher Education its support for the possible addition or inclusion of educational and consumer representatives on all state licensure boards in the health professions, in addition to appropriate practitioner and professional groups, and

Recommendation #2 - The HPEAC should similarly investigate and forward recommendations on the feasibility of formalized cooperative agreements with health professions licensing boards on matters relating to entrance requirements, program approvals, professional standards and the continual examination and revision of State Practice Acts and their accompanying rules and regulations.

Recommendation #3 - Among the additional objectives to be sought by the higher education community in its collaboration with accreditation, certification and licensing authorities, are exchanges of information and mutual identification of critical issues in such areas as:

1. Curriculum requirements and program evaluation;
2. Qualifying examinations;
3. Clarification of licensure objectives and elimination of dysfunctional and restrictive requirements such as age, residency, sex and sponsorship;
4. Restructuring of current practice acts to permit expanded duties by certain professional groups;
5. Criteria and mechanisms of re-licensure;
6. Problems of public confidence, often related to charges of "guildism" on the part of accrediting, certifying and licensing agenices;
7. Licensure by Endorsement;
8. Continuing Education.

Recommendation #4 - The HPEAC should identify and sponsor a study to investigate the long range implications, characteristics and results of a process for the certification by academic credential of selected health professionals. Evaluation procedures based on the performance criteria, including feed-back from health provider agencies and consumers, should be incorporated. In the establishment of this project, the input and assent of relevant legislative bodies, governmental licensing agencies, professional accrediting groups, and provider organizations should be secured.

Recommendation #5 - Investigation of the validity of the health service "organizational certification" concept, as an alternative to current individual health professional licensure procedures should be encouraged by the HPEAC. Support should be sought for a study which would incorporate criteria and mechanisms for evaluation of the concept. The many questions which critics of the idea have raised must be addressed, as well as the need for appropriate institutional exemptions from the various practice acts. It will be important to secure the input and assent of legislative, governmental licensing, and professional accrediting groups, and provider organizations in the design and implementation of the project.

Recommendation #6 - Representatives of the appropriate State professional and licensing bodies should be invited to participate in the deliberations of HPEAC subcommittees when major issues and policies in the credentialing area relating to their fields of interest and responsibility are discussed.

CHAPTER IV - RECRUITMENT, RETENTION AND MOBILITY

Recommendation #1 - Continued support should be given to remediation programs such as those recently launched by the CMDNJ, to increase the number and success of minority group students preparing to become physicians and dentists. Other institutions are encouraged to design analogous programs in the other health fields with critical personnel shortages. Promising persons evidencing academic potential, interest and motivation, even though their background preparation may be deficient in some respects, should be encouraged to pursue health professions programs through the provision of remediation and other supportive services. Such remediation programs should insure that all students ultimately reach the same level of preparation and competence so that the delivery of health care is not adversely affected.

Recommendation #2 - The Council on Higher Education in Newark, (CHEN), in cooperation with the Department of Education and the Newark school system, should immediately explore the possibility of developing a demonstration project involving the establishment and joint sponsorship of a high school program in the City which would concentrate on the science subject matter fields. Such a program can contribute in an important way to increasing the available pool of qualified minority group students entering the health professions programs in our higher education institutions. The faculties of the CHEN institutions should not only assist in the creation of appropriate curricula, but develop procedures to introduce such a high school's student body to the career challenges and opportunities available in the health professions.

Recommendation #3 -

a. Similar projects and programs should also be considered in other areas of the State, on the basis of experience gained in the above demonstration project.

b. It is further recommended that high quality introductory science programs be further developed in junior high schools in the State as a further mechanism to achieve the above objective.

Recommendation #4 - In the educational environments established by health professions education programs, close attention must be given to sensitizing their students to the problems, challenges and opportunities of practicing in the inner city and rural areas of the State where critical manpower shortages exist. The HPEAC should give priority to proposed programs creatively attempting to respond to this need, particularly in the proposed location and utilization of clinical facilities.

Recommendation #5 - The Department, with the assistance of the HPEAC, should review all present admissions requirements to the health professions education programs and insure that they are neither artificially strict nor rigid. Appropriate action should be taken not only with State agencies, but substantiated appeals also should be directed to national professional accrediting groups, where it is determined that their standards are unnecessarily high or restrictive.

Recommendation #6 - Data on the minority group composition of health professions program applicants, admittees and graduates should be collected and furnished periodically to the Department. It should not be inferred, however, that quotas be established regarding the representation of such students in these curricula.

Recommendation #7 - All of our health professions programs should review the qualifications of their applicants without regard to their sex and include representatives of both sexes on their admissions committees. Data on the sex of their applicants, admittees and graduates should be collected and furnished the Department on a regular basis. Part-time internships and residencies, where applicable, should be explored and instituted where feasible. The Department does not intend, however, that any of these recommendations be construed as calling for the imposition of specific quotas regarding the proportion of the sexes to be represented in the student bodies of health professions education programs.

Recommendation #8 - A mechanism should be set up whereby the Health Professions Education Advisory Council and the Department can furnish continuing guidance to the NJHCS, USEC, HRET and other consumers of the Health Professions Education Master Plan. The occupational priorities and other emphases in this master plan as well as subsequent updatings should serve as guidelines for these recruiting activities.

Recommendation #9 - The NJHCS should be given additional support to accomplish it's missions and should be encouraged and supported by the Department of Education and organizations employing health professionals since such agencies are the ultimate beneficiaries of the efforts of the Service. Greater emphasis also should be given in the NJHCS activity to use of college personnel to describe available programs and career opportunitites.

Recommendation #10 - The HPEAC should identify priority subject matter areas in which equivalency tests are needed. A thorough nationwide inventory should be made of examination instruments already in existence, and a working agenda established for the development of additional tests in cooperation with the Thomas Edison College, and appropriate professional groups, testing agencies and employer representatives.

Recommendation #11 - The HPEAC should establish a curriculum sub-committee representative of collegiate institutions, provider agencies, consumers, students, and appropriate professional groups, which will clarify the various definitions of the core approach and investigate existing practices and concepts. It should identify the rationale, objectives and procedures for establishing the core curriculum concept at the two and four year college level, and issue guidelines to assist the institutions of higher education interested in adopting this approach. The HPEAC should also assist all institutions of higher education in identifying course equivalencies so that credits are transferrable on an equitable basis.

Recommendation #12 - That the HPEAC assist in coordinating the activities of those institutions within the state which offer similar programs so that common sets of behavioral objectives and instructional modules can be mutually constructed as a first and essential step toward the development of statewide health professions education curricula and career ladders. The HPEAC will also seek the cooperation of appropriate national accrediting bodies, to assure that such program modifications remain congruent with nation-wide credentialing standards.

CHAPTER V - CONTINUING EDUCATION

Recommendation #1 - That continuing education programs in the health professions should be established in reference to the affective, behavioral and cognitive domains:

1. For updating the competencies of health professionals;
2. For the education of public officials at all levels of public health;
3. For the reinforcement of the understanding of guidance and vocational counselors of the changing nature and opportunities for students in the health professions;
4. For education of the citizen to participate in community organizations addressing health problems and their solution;
5. For the education of individuals in personal and family health care.

CHAPTER VI - ESTABLISHING INSTITUTIONAL RESPONSIBILITIES AND ASSIGNMENTS

Recommendation #1 - The State of New Jersey should be divided into four major regions for the purposes of planning in the health professions education field. These regions conform with the N.J. Comprehensive Health Planning Areas of the Department of Health's Comprehensive Health Planning Agency. The counties they incorporate are:

Area One - Bergen, Hudson, Passaic, Sussex
Area Two - Essex, Morris, Union, Warren
Area Three - Hunterdon, Mercer, Middlesex, Monmouth, Ocean and Somerset
Area Four - Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem

Recommendation #2 - The Department should support the formation of Health Manpower Committees in each of the N.J. Comprehensive Health Planning "B" Agencies. Coordination of these committees should be effected through the N.J. Comprehensive Health Planning Agency ("A" Agency). Membership on these area health manpower committees should include appropriate representation from educational and employer (clinical) institutions in each of the designated regional areas, as well as from the health professions and consumer groups.

Recommendation #3 - HPEAC and Departmental consideration regarding the formation of health professions education consortia, or the need to establish new health professions education programs, or significant enrollment expansions in existent programs, should include review of commentary from the "B" Agency Health Manpower Subcommittees regarding regional manpower needs, ease of access and other pertinent considerations.

Recommendation #4 - When it has been determined that a need for additional manpower production in a particular health occupational category is warranted, the HPEAC should define minimal requirements to meet objectives and indicate that program proposals from collegiate institutions would be welcomed for evaluation.

Recommendation #5 - The "B" Agency Health Manpower Committees should work with local education institutions in defining the need for in-service and related continuing education programs, for short courses and other extension activities, and for other ways in which these institutions can best respond to the health service delivery manpower needs of the region.

Recommendation #6 - As part of the planning process for new health professions programs, New Jersey colleges and universities should inventory the course, laboratory and faculty requirements to determine whether nearby institutions at other levels could be relied upon to provide such resources to their students.

Recommendation #7 - A fundamental responsibility of the HPEAC will be to quickly identify the institutional components of the health professions education consortia needed and those best capable of meeting the collegiate level health manpower requirements of their respective regions.

In the process of designating these varying kinds of consortia, the following suggested considerations are indicated, including:

a - Identification, "assignment", and development of proper relationships with nearby hospitals and other clinical facilities capable of supporting health professions education programs, and

b - Development of explicit short and ultimately long range plans for the separate and joint activities of the institutions composing health professions education consortia. Where more than one such institutional grouping exists within a region, plans for their coordinated efforts should be developed.

Recommendation #8 - As an integral aspect of the regionalization and health professions education consortium concepts, instructional programs should be aggregated within institutions in logical groupings or "clusters" of allied health professions programs. The academic cluster should possess significantly similar concerns in the health delivery process, and consequently a large degree of overlap in their preparatory curricula.

Recommendation #9 -

In-house programs - The CMDNJ should itself offer certain carefully identified programs in the allied health professions. In general, the College should contract for the remedial, general and pre-clinical course aspects of these programs with nearby higher education institutions, rather than hiring its own staff for these purposes.

Recommendation #10 -

Affiliated Programs and Responsibilities - On the basis of voluntary agreements, the CMDNJ should be considered by other educational institutions for the provision of the clinical components of their programs. In these joint efforts, of course, the CMDNJ role would be substantial in helping shape the general academic curriculum.

CHAPTER VII - USE OF CLINICAL FACILITIES

Recommendation #1 - To facilitate the pooling of information concerning the wide variety of health facilities resources available, an accurate and comprehensive statewide data bank which would inventory the specialized facilities available, and identify the number of students they could support for specific learning experiences, should be established by HPEAC. Where such information is readily available from such agencies as the Hospital Research Education Trust of New Jersey, it of course should be utilized.

Recommendation #2 - In its review of health professions education programs, the HPEAC should employ the use of site visits to support facilities when deemed appropriate, in addition to reviewing information and endorsements from the colleges, accrediting bodies, etc. The HPEAC should develop standard questionnaires for receipt of information on health professions programs, applicable to the clinical as well as other program aspects.

Recommendation #3 - The HPEAC should stimulate the development of innovative scheduling patterns through expansion of the capacities of existing resources, including the extension of the hours of use and the judicious sharing of off campus facilities by several institutions and a variety of health professions programs.

Recommendation #4 - The HPEAC likewise should encourage the identification and investigation of health facilities presently underutilized for health professions education purposes. Given the changes taking place in the patterns of health care delivery, the patterns of clinical experience should reflect as much as possible future health delivery systems. Wherever appropriate, health personnel should be rotated during their studies through a variety of service centers in addition to hospitals, including family care and community health centers, group practice and ambulatory care units, and a variety of structural arrangements, including alternate forms of health care teams.

Recommendation #5 - The HPEAC should also investigate potentials for interchange and transferrability of practicum credits between educational institutions, particularly the acceptability of clinical credits received in two-year programs and both practicum and didactic credits received in free-standing programs by four-year collegiate institutions.

Recommendation #6 - The HPEAC should establish a study committee which will analyze the factors involved in possible collegiate reimbursement for use of health facilities, as well as those related to possible DHE support and coordination of hospital related programs at the collegiate level. Recommendations by the HPEAC on these two major issues should be based on analysis of: anticipated impact on collegiate programs; current and projected rationale for such collegiate and DHE support including indicated operating requirements and standards to be established by these funding institutions; formulae delineating educational from service components of clinical activity upon which funding might be equitable established.

CHAPTER VIII - FACULTY PREPARATION AND DEVELOPMENT

Recommendation #1 -That those colleges and universities within the State which presently offer teacher preparation programs, together with institutions with significant commitment to health professions training programs, should create joint programs which would offer a curriculum package in effective teaching techniques as a minor area of concentration for persons who are engaged in specific health professions careers.

Recommendation #2 - All institutions which offer health professions education programs should encourage their faculty to pursue continuing education programs designed to enhance their teaching skills.

Recommendation #3 - On a regional and where possible statewide basis program directors and faculty engaged in similar programs should conduct on-going workshops for the sharing and improvement of teaching resources; the development of guidelines to evaluate teacher performance, and the establishment of mechanisms to assure that standards are being maintained, including use of student evaluations. Special attention should be given to developing faculty sensitivities and skills in the education of disadvantaged minority students. Evaluation of teaching performance and maintenance of academic standards are ultimately the prerogative of the faculties of the individual institutions.

CHAPTER IX - RESEARCH IN THE HEALTH SCIENCES

Recommendation #1 - A New Jersey Health Research Advisory Council be created to recommend policy and to advise the Department regarding necessary but unmet health related State research needs to be performed by educational institutions, to encourage support for research in areas not available from other sources, to identify research goals, and to recommend overall funding levels. The Council should be composed of representatives of institutions of higher education, health provider agencies, citizen groups, the public, as well as the State Departments of Health, Institutions and Agencies, Environmental Protection and Higher Education. This Council would encourage inter-institutional cooperation and inter-disciplinary research, and would evaluate issues balancing the needs of basic and applied research. An especially important area of concern will be research, demonstration and evaluation of changes in the health care delivery system, based upon input from the clinical, natural and social sciences. This Council would recommend the distribution of state funds and coordinate interdisciplinary programs. The Council should not encumber or restrict institutions in their search and negotiation for private or federal monies.

CHAPTER X - MANPOWER NEEDS IN THE OCCUPATIONAL CATEGORIES

Recommendation #1 - The Departments of Health and Higher Education should engage in a continuing process of improving the data base for health manpower projection purposes, including developing and encouraging the use of comparable and comprehensive registries of personnel. In addition, they should continue to improve the projection model, accounting for relevant variables not presently included in the HMDP analysis. The development of a computer program to facilitate the periodic updating of manpower projections likewise should be pursued.

PHYSICIANS

Recommendation #1 - The CMDNJ is strongly encouraged to pursue vigorously its present explorations for the establishment of a third medical school in the southern portion of the State. This facility should plan to graduate, if possible, an additional 160-200 physicians per year once fully operational.

Recommendation #2 - Long range expansion of the productive capacity of New Jersey's medical education system warrants investigation into the development of alternative mechanisms including the utilization of basic science facilities and faculties that exist outside the existing medical education centers, as well as the optimal use and expansion of clinical teaching capacity at community hospitals and health service centers throughout the State.

Recommendation #3 - The CMDNJ should complete current studies on the feasibility and appropriateness of initiating a shortened and/or consolidated medical school curriculum. In this context, possibilities for reducing the total academic sequence in the preparation of M.D.'s should be explored with other institutions in the State. Consideration also should be given in these studies to the desirability of combining a foreshortened curriculum with the creation of specialty "tracks" for medical students pursuing a variety of career goals.

Recommendation #4 - The so-called "fifth channel in New Jersey" supervised clerkship program for foreign medical graduates, which has been launched by the CMDNJ in academic year 1972-73, should be continuously evaluated and serious consideration given to its continuation and expansion in subsequent years to alleviate the current physician shortage in New Jersey. The program should provide a supplementary, intensive, high-quality educational experience geared specifically to eliminating deficiencies in the previous clinical training of FMGs. The program should enable its participants to proceed directly into the mainstream of U.S. medical practice.

Recommendation #5 - The CMDNJ should continue participating in the recently implemented Task Force composed of governmental agency, professional society, and hospital medical education representatives to address the problem of improving graduate medical education programs in the State. The consequneces of these efforts should be to attract more American trained physicians to perform their internship and residency training, and hopefully establish their subsequent practices, in New Jersey, while simultaneously contributing to raising the standards and levels of care available in our hospital facilities. The Task Force should address the question of costs of such training, appropriate financing mechanisms, the need for physician specializations in the State, and the delineation of appropriate clinical resources to support the required programs. The Department of Higher Education is committed to the support of such activities.

Recommendation #6 - All appropriate mechanisms should be employed to insure that physician education and utilization are consonant with societal needs. These mechanisms include; (a) insuring that as appropriate levels of medical judgment in health care delivery are defined, curriculum and training should be geared to those needs to prevent needless overeducation; (b) preparation of auxiliary personnel to perform largely diagnostic and/or therapeutic tasks not requiring medical judgment; and (c) as part of the team concept of medical education, student physicians should be made aware of appropriate ways to work with other members of the health care team to insure their optimum utilization as well.

PHYSICIAN'S ASSISTANTS

Recommendation #1 - That a survey of physicians and hospitals be conducted by a broadly constituted HPEAC task force to determine the need for physician's assistants so that programs can be developed accordingly. The survey should identify responsibilities and authorities to be delegated to such personnel. The task force should develop prerequisite guidelines for admission to P.A. programs related to educational background, and prior health service or biological experience, giving consideration to the need for alternative entry levels depending upon individual student qualifications, motivation and maturity. Finally, the task force should develop evaluation and performance criteria whereby New Jersey's P.A. programs and their graduates can be judged in relation to their contribution to health care delivery.

Recommendation #2 - That the HPEAC, with the assistance of the New Jersey Medical Society, the State Board of Medical Examiners, and the CMDNJ, investigate immediately the credentials situation and recommend appropriate regulatory procedures for physician's assistants in New Jersey. These procedures should be established at least concurrently with the initiation of physician's assistant programs in the State.

Recommendation #3 - That initially only a limited number of physician's assistant education programs be developed within the State and that all such programs be designed and offered in affiliation with the CMDNJ.

Recommendation #4 - The HPEAC should encourage appropriate organizations and institutions to engage in a broad program to educate the general public on the emerging role of physician's assistants in health care delivery.

PROFESSIONAL NURSES

Recommendation #1 - Involvement in health and patient care services should remain the continuing central concern of professional nursing and nursing education.

Recommendation #2 - The appropriate professional agencies should continue their efforts to design practice definitions that would reflect the emerging functional parameters of professional nursing practice. Once adopted, the State Board of Nursing should ensure, through appropriate licensing/credentialing, that standards of safety and competence in practice are being met. Such a step should not be taken without involvement of those professionals with whom nursing relates in the inter-disciplinary setting of health care services.

Recommendation #3 - It is our recommendation that all educational programs in the State prepare nursing personnel to assume extended and expanded roles in nursing practice.

Recommendation #4 - It is our further recommendation that nursing programs review their curricula to ascertain and ensure that they are part of a flexible and articulating system of nursing education (including the use of such evaluative tools as equivalency exminations).

Recommendation #5 - That a nursing subcommittee of the Health Professions Education Advisory Council be formed and that it be composed of nurse educator, nurse practitioner and consumer representatives. This subcommittee should recommend to the Council specific guidelines, standards, and programs for nursing education throughout the State. While such recommendations would not imply any loss of institutional authority for individual programs, it is anticipated that a broadly constituted, inter-regional subcommittee would be capable of playing a leadership role in advising the Council and the Department.

Recommendation #6 - To take such actions as are necessary to maintain the requisite total number of nurse program graduates at the appropriate level, particularly where there is need to compensate for any continuing decline in the number of diploma school graduates.

Recommendation #7 - The Department should conduct research to assess the effectiveness of the graduates in the employment setting of the three different types of programs preparing registered nurses in New Jersey today.

Recommendation #8 - *That all nursing programs within the State re-evaluate their current supply of teaching facilities and resource requisites for program implementation. In situations where enrollments are to be increased or new programs started, regional agreement among the various programs and agencies should be sought regarding the cooperative utilization of available clinical facilities. Use of non-hospital clinical resources to support the educational program also should be re-evaluated in this context.*

Recommendation #9 - *That masters degree level nursing programs which would allow preparation for a variety of nursing responsibilities be established within the State as soon as possible. The advantages of collaborative arrangements should be fully explored in developing these masters level programs.*

Recommendation #10 - *That the Nursing Subcommittee of the Health Professions Education Advisory Council should develop a statewide continuing education plan. Such a plan should insure that a representative range of subject matter will be available to interested R.N.s during the course of each year, at sites dispersed through all regions of New Jersey. Recommendations relating re-licensure procedures to continuing education activity, likewise should be considered.*

Recommendation #11 - *That the Nursing Subcommittee of the HPEAC assume the task of specifically analyzing and elaborating guidelines which will affect articulation and transfer among nursing programs within the State, and;*

Recommendation #12 - *That as a part of this task they investigate and recommend to the Department opportunities for the initiation and expansion of articulating nursing programs to provide the necessary transfer opportunities for diploma and associate degree nurses.*

Recommendation #13 - *That additional professional nursing manpower should be produced within the State in accord with the following priorities:*

1. *The development and expansion of articulating nursing programs leading to the baccalaureate degree;*

2. *Closely controlled increased enrollments in present programs during the period when absolute shortages continue to persist;*

3. *The creation of new programs when and if indicated by regional demand.*

DENTAL HEALTH PERSONNEL

Recommendation #1 - It is recommended that the dental and dental auxiliary schools of this state, through the coordination of the Health Professions Education Advisory Council, formulate a state-wide plan for the sharing of clinical facilities so that dental and auxiliary students, during an appropriate state of their training programs, may as a team share common clinical learning experiences and thus develop a strong orientation to the concept of a team approach to dental care delivery.

Recommendation #2 - It is recommended that all dental auxiliary program directors work together in the development of core curricula and instructional modules which include expanded duties and which are designed to form a career ladder which offers accessibility to advancing students, returning auxiliary veterans and other health related personnel.

Recommendation #3 - Dental and dental auxiliary schools should cooperatively develop experimental programs which include expanded functions. These institutions should work with the State's dental and auxiliary societies and the State Board of Dentistry in the development and introduction of legislation which will greatly increase the flexibility of the State's Dental Practice Act to include provisions for the delegation of supervised expanded functions to adequately trained and appropriately licensed hygienists.

Dentists

Recommendation #4 - Both dental schools within the State should examine their respective presently untapped possibilities for increasing their enrollments through the maximum utilization of facilities throughout the calendar year.

Recommendation #5 - The Dental Schools within the State must continue to re-examine their curricula and to make such revisions as will not only lead to further reductions in their length, but more importantly give emphasis to the enhanced socio-psychological role dentists should play in raising the public's consciousness and willingness to seek appropriate dental care.

Recommendation #6 - The two dental schools, in cooperation with the New Jersey Hospital Association, should actively seek to create general practice and rotation internship possibilities for their graduates within these hospitals, neighborhood health organizations, health maintenance organizations, and other large clinics in which adequate facilities and educational experiences can be provided. If possible, such experiences also should be incorporated into the undergraduate dental curricula so that a broad learning environment is provided and the potential for the graduates' location within the State is enhanced.

Recommendation #7 - The State's dental schools should develop a comprehensive long-range and appropriately staged strategy for the improvement and expansion of their graduate specialty programs.

Recommendation #8 - The State's dental schools should conduct demonstration programs which will train dental students to cooperate and function with both traditional and expanded duty auxiliaries, and simultaneously engage in an applied research analysis of the efficacy of alternate patterns of dental care delivery.

Recommendation #9 - It is recommended that the two dental schools, the State dental societies, other auxiliary societies and the State Board of Dentistry cooperate in the development of a State-wide system of continuing education for both dental practitioners and their auxiliaries. A system of this type should be designed to maximally utilize the educational resources of both the dental and auxiliary schools.

Dental Hygienists

Recommendation #10 - The development of the dental therapist HMOC should be postponed within this State and efforts should be concentrated on revising the present Dental Practice Act so that the functions which both dental hygienists and dental assistants can perform under the supervision of a dentist are expanded.

Recommendation #11 - Presently accredited dental hygiene programs within the state should offer, in cooperation with the State's dental schools, experimental (pilot) programs which include the teaching of those expanded functions which the Inter-agency Committee on Dental Auxiliaries has recommended as being appropriate for delegation to dental hygienists. These programs should be developed with the help and guidance of the State's dental and auxiliary societies and the State Board of Dentistry.

Recommendation #12 - Presently accredited dental hygiene programs, in cooperation with the State's dental schools, should develop an instructional module of short (several months) duration which will enable presently practicing dental hygienists to return to school for a short period of time in order to become proficient in the performance of the above mentioned expanded duties.

Recommendation #13 -

a - New dental hygiene programs should be initiated following appropriate consultation with resource persons from the State's dental schools and where regional demand and institutional responsibilities support such an initiative.

b - Where feasible, present dental hygiene programs should seek means of expanding their enrollments through improved utilization of their facilities, and/or the sharing of clinical facilities with the two schools of dentistry, thus affording additional opportunities for increased hygiene student enrollments in the two year colleges.

Recommendation #14 - *The directors of the dental hygiene programs should jointly and continually analyze the content and length of their programs. The thrust of this examination should be directed not only to an assessment of the curricular underpinnings of the hygienists' traditional role in private practice, but also to their assumption of duties in hospital, school and other public health settings.*

Dental Assistants

Recommendation #15 - *Directors of dental assisting programs and appropriate resource persons from each dental school should develop programs and affiliations which would meet the following requirements:*

a - That new dental assisting programs be initiated following appropriate consultation with the State's dental schools wherever regional demand and institutional capabilities support such initiatives.

b - Where feasible present dental assisting programs should seek means of expanding their enrollments through improved utilization of their facilities, and/or the sharing of clinical facilities with the two schools of dentistry.

c - That program directors examine the other aspects of their curricula, including their length and content, to insure they will support future activity of their graduates in dental care settings beyond the traditional solo practice environment.

Recommendation #16 - Directors of dental auxiliary programs (medical dental secretary up to two-year assisting programs) jointly develop a training ladder which will provide:

a - Advanced placement opportunities at the vocational or community college level for graduates of high school dental auxiliary programs.

b - Appropriate continuing education opportunities for presently practicing dental assistants.

c - Articulation with advanced placement opportunities in dental hygiene programs.

Recommendation #17 - Presently accredited dental assisting programs, in cooperation with the State's dental schools, professional societies and the State Board of Dentistry, should develop continuing education sequences which will enable certified dental assistants to be trained in those expanded functions which can appropriately be learned in a continuing education program, and;

Recommendation #18 - Presently accredited dental assisting programs within the State should offer, in cooperation with the two dental schools, experimental (pilot) programs which include the teaching of those expanded functions which the Inter-agency Committee has recommended as being appropriate for delegation to certified dental assistants. These programs should be developed with the help and guidance of the state's dental and auxiliary societies and the State Board of Dentistry.

Recommendation #19 - The state's dental and dental auxiliary educators develop equivalency or challenge examinations based on the North Carolina format which could be used throughout the state for testing interested candidates for placement in the dental auxiliary training ladder.

Dental Laboratory Technician

Recommendation #20 - The creation of additional dental laboratory technician training programs should be fostered within the State. Priority in approving such programs should be given tothose institutions which already have, or can present well elaborated plans to establish other dental auxiliary programs, so that the benefits of program clustering can be realized.

PHARMACISTS

Recommendation #1 - The Rutgers College of Pharmacy should immediately establish a task force to recommend applied research regarding alternative ways of delivering pharmaceutical services of high quality. This task force should be representative and fully reflective of the realities of the practice of pharmacy. Consideration should be given to mechanisms which have been developed abroad, and attention given to such questions as centralization of services and the provision of 24-hour service to the community.

Recommendation #2 - The Rutgers College of Pharmacy should be encouraged to further introduce into its curriculum material which will sensitize its students to the import of the changing need for pharmaceutical services. It should develop understanding of alternative educational opportunities in pharmaceutical science and of different modes for the delivery of pharmaceutical services.

Recommendation #3 - The Health Professions Education Advisory Council should create a study group to determine if a need exists for an associate degree program at the community college level, which would prepare a pharmacy aide or assistant who could contribute to the more efficient use of the pharmacist's time. Representatives from the Rutgers College of Pharmacy, the two year colleges, and the various professional organizations and facets of the pharmacy profession, should be included in this study group.

Recommendation #4 - The Department of Higher Education and the Rutgers College of Pharmacy jointly conduct studies of space utilization factors, and methods for extending the length of the school year and day, to determine the extent to which enrollments can be increased at the College. Simultaneously, analysis should be made of the effect upon current admissions and academic standards of any substantial enrollment increase, with a view to identifying a proper level for such standards, in order to produce graduates of the requisite quality to meet the public's health care needs. Study should also be made of the consequences of reduction of internship on (1) the number of pharmacists graduated and (2) the quality of training received.

Recommendation #5 - The Rutgers College of Pharmacy should make available its full cooperation, resources and services to the Council on Continuing Pharmaceutical Education, to assist in the establishment and maintenance of a program of the highest quality.

VETERINARIANS

Recommendation #1 - The number of veterinarians educated under official State auspices should be raised to at least 35 per year. The Department with the assistance of the Veterinary Medical Education Advisory Council should seek to meet that goal through some combination of increased numbers of student spaces contracted for under the Veterinary Medical Education Act of 1971, and/or consortium arrangements concluded with existent or newly formed veterinary medical schools in other states.

Recommendation #2 - The Veterinary Medical Education Advisory Council, in conjunction with other interested parties, consider establishing a task force to explore methods by which productivity can be increased. The task force should concern itself with the ways in which current technology can be effectively integrated into all aspects of veterinary practice.

Recommendation #3 - The Veterinary Medical Education Advisory Council immediately study the need, and if justified, make recommendations regarding the creation of additional programs at the A.A.S. level, designed to train animal technicians. These programs should follow the guidelines established by the American Veterinary Medical Association's Council on Education.

MEDICAL TECHNOLOGISTS

Recommendation #1 - HPEAC should recommend disapproval of additional programs in medical technology at this time.

Recommendation #2 - HPEAC with the aid of both educators and professionals in the field should evaluate, on a continuing basis, the curriculum of medical technology programs at the baccalaureate and A.A.S. levels to insure that future graduates are given the training that is necessary to provide New Jersey residents with quality service.

Recommendation #3 - HPEAC should encourage the development of programs for continuing education in medical technology as well as refresher education programs for people who wish to reenter the labor force.

MEDICAL LABORATORY TECHNICIANS

Recommendation #1 - Each proposed new program for Medical Laboratory Technicians should be reviewed in the light of the evolution of this particular HMOC and the status of manpower needs and utilization, at the time it is proposed.

CYTOTECHNOLOGISTS

Recommendation #1 - Community colleges should explore establishing affiliations with those hospitals within their CHP Areas that currently have programs in cytotechnology, in order to provide an appropriate academic background for such manpower. These colleges should collaborate with the New Jersey Association of Cytotechnologists in order to identify the indicated courses for this purpose.

RADIOLOGIC TECHNOLOGISTS

Recommendation #1 - Consideration should be given by colleges presently offering programs in radiologic technology to increase the number of graduates in this field to close the manpower gaps identified by this master plan and, where necessary, new programs should be launched by other colleges to supplement their efforts. In addition, hospital based programs should give serious consideration to incorporating their training plans into existing or future college programs, in order to place them within an academic framework which will promote professional mobility.

RESPIRATORY THERAPISTS AND TECHNICIANS

Recommendation #1 - Because of the lack of clarity regarding the need for manpower in this HMOC, HPEAC should exercise caution before it recommends the approval of new programs.

Recommendation #2 - HPEAC should immediately establish a task force to develop quality standards for current programs in the respiratory therapy field and, where appropriate suggest the necessary curriculum changes. These standards should be consistent with the guidelines established by the Joint Review Committee for Respiratory Therapy Education. In addition, this task force should work with the appropriate certification agencies to ascertain whether the examination for credentialing personnel in the field is appropriate to the needs of the employment market.

Recommendation #3 - HPEAC and its task force should continue to solicit input from professionals and educators as to the changing role that the therapist is playing in the health team. Furthermore, HPEAC should continue to monitor, on a regular basis, the supply and demand for personnel in the respiratory therapy field in order to evaluate overall State and regional needs.

OCCUPATIONAL THERAPISTS

Recommendation #1 - In considering establishing a program in occupational therapy in the State the colleges, the Health Professions Education Advisory Council, and the Department must fully deliberate its possible location in the context of the regionalization, area health education consortia, and program clustering recommendations made in Chapter VI. In all probability, moreover, the establishment of a single program will suffice to meet the State's future needs.

PHYSICAL THERAPISTS

Recommendation #1 - There appears to be no need to launch a program in physical therapy in New Jersey at the present time. Any program launched would rapidly exacerbate an anticipated oversupply of personnel in this field. Although there exists absolute personnel shortages at present, they are rapidly disappearing. In this field it would appear appropriate to assign the responsibility to employers to find ways to fill their immediate requirements, rather than ask the higher education community to divert resources from more needy fields.

SPEECH PATHOLOGISTS AND AUDIOLOGISTS

Recommendation #1 - One or possibly two additional programs in speech pathology and audiology should be established. Furthermore, in order to eliminate the regional imbalance of programs, the new programs should preferably be located in CHP Area 1 and/or CHP Area 4. The availability of qualitative centers engaged in activity in this field, to provide appropriate field experiences, also must be considered in determining the location of new programs, however:

HEALTH CARE MANAGERS

Recommendation #1 - The HPEAC should designate a representative study group to determine if there exist potential (long-range) alternative roles for health care managers and to recommend the size, quantity and nature of appropriate educational programs to encompass these different emphases for health care managers. As part of this study, analysis should be made of what utilization is being made in New Jersey of graduates of existent hospital administration programs, and the implications for any health care manager programs launched at the master's level in the state. Task analyses of the administrative functions performed in health delivery facilities should be examined, and determinations made generally as to the proper educational levels required for graduates to perform these jobs competently.

Recommendation #2 - In the immediate future, the HPEAC should review and consider approving a limited number of program proposals for Health Care Managers, even while the study in Recommendation #1 is being conducted. The HPEAC should review such proposals not only on the basis of the special qualities foreseen among their graduates, but also with respect to their provision of alternative types of educational and employment opportunities. Criteria for these alternative educational opportunities should include (1) the level of the program; (2) the emphasis or objectives of the employment situation; and (3) differing internship opportunities. Follow-up evaluation of the utilization and employment of the graduates of all programs should be incorporated.

Recommendation #3 - Consideration be given to the development of certificate or degree programs in management and administration which can be offered, at convenient times, to presently employed health, or health related managerial workers to supplement their *ad hoc* learning experiences.

Recommendation #4 - Each educational program have an appropriate clinical component to provide necessary practical experience, and that adequate supervision be insured during this period. Rotating internships should be incorporated as appropriate to best meet the needs of program graduates and employing institutions.

MEDICAL RECORDS ADMINISTRATORS

Recommendation #1 - The Department and Board of Higher Education should be receptive to the inauguration of a single baccalaureate level program for medical records administrators. It should be affiliated with a modern hospital's medical records department, under the leadership of a registered records administrator (librarian), which would provide practical exposure for student demonstration, observation, and directed experience purposes. The development of proficiency examinations should also be encouraged to permit mobility within the profession.

MEDICAL RECORDS TECHNICIANS

Recommendation #1 - The HPEAC should supervise a study of the medical records technician, medical secretary and medical (office) assistant HMOCs to ascertain the feasibility of creating a single broad career occupational curriculum, incorporating specialty options where indicated. Pending the completion of this study, no further program approvals should be considered by the Department and Board of Higher Education in any of these three fields.

HEALTH EDUCATORS AND INFORMATION SPECIALISTS

Recommendation #1 - The HPEAC should organize a study group immediately for the identification and development of: evolving needs of health education; of new programs; of numbers and types of personnel required to meet these needs; of educational programs at various collegiate levels needed to create appropriate personnel, including where indicated internship experiences; and of effective evaluation of these programs.

Recommendation #2 - Appropriate agencies and institutions should develop a joint program which would offer common background and practical training experiences, with appropriate formal certification, in the field of health information services, to individuals interning in communications media and extension service programs, in order to maximize public understanding of health problems.

DIETITIANS

Recommendation #1 - In the dietetics field the existent programs should seek ways to increase their enrollments in keeping with the manpower needs identified herein. The Department and Board of Higher Education should consider approval of new programs only where regional lacks warrant, and in keeping with the principles of regionalization, health professions education consortia, and program clustering identified in Chapter VI.

Recommendation #2 - Internship programs or post baccalaureate experiences to quality dietitians to become registered should be made available within the manpower projections outlined in this section.

CHAPTER XII - EVALUATION AND REVIEW OF THE HEALTH PROFESSIONS EDUCATION MASTER PLAN

Recommendation #1 - The HPEMP Advisory Committee should remain in existence and be reconstituted in order to continue the process of assisting the Department in the evaluation of the Master Plan, and updating, expanding, and/or revising it as needed.

Table of Contents

Page

Acknowledgements i
Glossary v
Summary of Recommendations viii

I. Introduction 1

II. Team Concept of Health Care Delivery and the Education of Health Professionals 10

III. Accreditation, Licensure and Certification: factors affecting manpower availability 18

IV. Recruitment, Retention and Mobility 28

- A. Special consideration: the educationally disadvantaged 28
- B. Special consideration: representation of the sexes 31
- C. Recruitment 32
- D. Retention and Mobility of Students 33
  1. Equivalency and proficiency testing 35
  2. Core Curricula 36
  3. Modularization of Learning Units 38
- E. Career retention and mobility 39

V. Continuing Education 41

- A. Updating the competencies of health professionals 41
- B. Education of Public Officials 44
- C. Education of Guidance Counselors and Vocational Counselors 44
- D. Citizen Participation in Community Health Organizations 44
- E. Continuing Education in Individual and Family Health Care 45
- F. Conclusion 46

VI. Regionalization and Institutional Cooperation 48

- Regionalization 48
- Institutional Cooperation 54
  - Sharing of Resources 54
  - Institutional Consortia 57
- Clustering of Curricula 59
- Institutional Roles 61

VII. Use of Health Facilities Resources 65

VIII. Faculty Preparation and Development 72

IX. Research in the Health Sciences 76

Table of Contents (Continued)

Page

X. Manpower Needs in the Occupational Categories 80
- Physicians 97
- Physician's Assistants 118
- Professional Nurses 129
- Dental Health Personnel 163
  - Dentists 174
  - Dental Hygienists 182
  - Dental Assistants 192
  - Dental Laboratory Technicians 199
- Pharmacists 206
- Veterinarians 215
- Medical Technologists 227
- Medical Laboratory Technicians 232
- Cytotechnologists 234
- Radiologic Technologists 237
- Respiratory Therapists and Technicians 243
- Occupational Therapists 250
- Physical Therapists 253
- Speech Pathologists and Audiologists 256
- Health Care Managers 259
- Medical Records Administrators 263
- Medical Records Technicians 265
- Health Educators and Information Specialists 269
- Dietitians 278

XI. Implementation of the Master Plan 281

Implementation Procedures 281

A. The Purposes and Composition of the HPEAC 282
B. The HPEAC as a Statewide Coordinator 283
C. Proposed grouping of Program Directors and Deans 285

Conclusion 285

XII. Evaluation and Review of the HPEMP 286

Appendices

A. Advisory Committee, Health Professions Education Master Plan

B. Major Meetings, Conferences, Workshops held to discuss Preliminary and Revised Drafts of the Health Professions Education Master Plan

C. Health Professions Education Advisory Council

D. Health Professions Education Advisory Council, Members & Alternates

E. Report of the Health Manpower Data Project (Separate Volume)

F. Inventory of Health Professions Education Programs

G. Supplement to Appendix E, December 1972
- Veterinarians
- Medical Laboratory Workers
- Respiratory Therapists and Technicians
- Speech Pathologists and Audiologists

CHAPTER I

INTRODUCTION

New Jersey, along with much of the rest of the nation, supports the principle that health care of high quality is the right of all its citizens. In his First Annual Message to the Legislature in January 1971, Governor William T. Cahill stated: "Although there has been progress, I must reaffirm my conviction that a crisis exists in health care delivery and that urgent action is required...we must renew our efforts to deal directly with the conditions jeopardizing the health and well-being of New Jersey's citizens."

In keeping with that charge, the Department of Higher Education established an Office of Health Professions Education whose responsibility it is to assure an adequate supply of qualified, college trained health manpower to meet the needs for quality health services in the State. Fundamental to meeting this goal is the elaboration of an effective framework establishing the philosophy, policies, manpower needs, and program guidelines relating to the education of health personnel in the collegiate setting. Consequently, in the context of general master planning by the Department, a Health Professions Education Master Plan (HPEMP) is being prepared by this office.

Rapid socio-economic, political and technological changes, including the rising demand for health services, have resulted in an unprecedented and imperative need to adjust both our health care delivery systems, as well as to expand and flexibly adapt our programs for the preparation of health workers. Among the factors which have been identified as causing increased demand for health personnel are: population and real income growth; rising public expectations for additional and improved health services more equitably distributed; broader health insurance coverage; governmental efforts to improve the planning and implementation of health care programs; growth of medical knowledge in the prevention, diagnosis and treatment of illness; recognition that poor health is a hindrance to national development; realization that our increasingly affluent and industrialized society creates a new range of health hazards. We need a genuinely comprehensive manpower program, moreover, to ensure that the preparation of health personnel meets the increasingly sophisticated requirements of our society.

The responsibility of the Department and the colleges and universities is defined by the fact that, with some exception in the case of the medical and dental schools, the institutions are essentially educational service agencies charged with producing personnel. With respect to shaping the future configuration of health delivery higher education can seldom play a direct role, but is generally confined to the conduct of demonstration projects.

Nor is our charge made easier by the frequent absence of clear definitions from health providers of the directions, instrumentalities, and interrelationships of health professionals, which health care will call for in the future.(1)

The purpose of the HPEMP, therefore, is to set guidelines for an interrelated network of educational programs to meet the changing needs for health manpower in the State. We realize, though we lack a firm picture of the ultimate shape of health services and the related need for personnel, that we are obliged "to struggle towards it." We accept the admonition set by Alvin Toffler that "the inability to speak with precision and certainty about the future... is no excuse for silence." What we decidedly cannot perpetuate is a fragmented, unsystematic approach to creating health professions education programs, often as a response to crisis situations, or the enrollment expansion objectives of individual institutions, or the unexamined demands of professional groups.

The Health Professions Education Master Plan of 1973 is nevertheless intended as only a "first cut" at planning for our responsibilities in this area. It is envisaged as the first generation model of what must be regarded as a "rolling master plan". In subsequent years it will be expanded in its scope of coverage, and refined in terms of its methodological principles and the quality of its assumptions and data, in keeping with the recurrent evolution of our health delivery systems.

In preparing this master plan the Department has addressed four major goals:

1. To create a research instrument which will assess current supply, utilization rates, and the projected demand for health professionals by 1985 in selected Health Manpower Occupational Categories (HMOCs).

2. To open, for institutional and public discussion, a number of critical issues related to health professions education; to recommend possible solutions, and as a result of subsequent discourse, develop appropriate policy.

3. To establish a framework within which an effective statewide advisory agency can assist the Department and Board of Higher Education in the planning and development of collegiate level health professions education programs.

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(1) We use the term "health professional" to identify all those individuals who are educated at the collegiate level, understanding, of course, that there are many levels of training, but wary of the invidious comparisons which often survive to the detriment of the "health team" concept.

4. To propose a mechanism for the implementation of the master plan which encourages interinstitutional, statewide, and regional area coordination.(2)

We are cognizant that in the achievement of these goals increased coordination and cooperation will be needed among the health professions, educational institutions, health facilities, governmental agencies, licensing and accrediting organizations, voluntary agencies, concerned public, etc. We have attempted to elicit their opinions in the elaboration of this plan. The preliminary and revised drafts and subsequent documents are being broadly distributed to representatives of each of these groups for their critique, in an honest attempt to incorporate their views as was outlined in our second major goal. A growing contact list of over 1600 organizations and individuals will receive this study, and we are constantly adding further recipients.

During the HPEMP's review process we have attempted to identify the persons or groups affected by and concerned with this plan:

1. The collegiate institutions preparing health professionals, including the students enrolled in their programs.
2. The professional and licensing organizations in the health professions, and the employing (provider) agencies utilizing the skills of these students upon graduation.
3. The general public, the ultimate consumers, receiving health services from these students following the completion of their training.

We believe there has been positive and increasing participation of all these groups both in the elaboration of the HPEMP and the mechanisms established to assist in its implementation.

The 25 specific HMOCs to be addressed in this 1973 version of the HPEMP were chosen as representing the highest priority fields that knowledgeable and reasonable people could agree are necessary to a sound contemporary health delivery system. They represent only a tenth of the taxonomy of health occupational titles listed by the U. S. Public Health

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(2) The establishment in March 1972 of the Health Professions Education Advisory Council represents a major aspect of the type of cooperation and coordination suggested in goals 3 and 4.

Service.(3) They were chosen following extensive discussion with the N. J. Regional Medical Program (NJRMP), the N. J. Hospital Association (NJHA), the N. J. Department of Health's Comprehensive Health Planning Office (CHP), the College of Medicine and Dentistry of New Jersey (CMDNJ), and commentary from the extensive contact list previously cited. It would have been impossible to address at once all of the occupational categories, even confining the study as we do to those personnel prepared in institutions of higher education.(4) As noted above, however, it is our intention to direct studies towards an ever larger number of distinct fields in the years ahead.

Underlying all of our dicussions is a concern for the importance of direct patient care, the growing need for comprehensive, preventative and outpatient services, and the necessity to so prepare personnel as to foster their ability to flexibly grow and shift their practice responsibilities in keeping with the changing nature of health care delivery.

Further, we believe that all health care workers, no matter what their function or professional level may be, should realize that the prime objective of their duties is care of the individual patient, as a total human being within the full context of his environment. A profound sense of compassion for people in need and an understanding of the dignity and worth of the individual are, therefore, motivations which we would hope to see fostered by the educational programs. They should seek to provide students with a comprehensive view of the human condition, as well as developing their technical competency.

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(3) See Health Manpower Resources, USPHS Publication No. 1509, 1968, Appendix, List of Health Occupations. This list actually identifies approximately 125 separate occupations, while also showing about 250 alternate titles such as synonyms or designations related to form of practice, type of specialty, or place of practice. The titles were compiled by the Division of Allied Health Manpower, Bureau of Health Manpower. In the short four years since the publication of that study, the number of titles, if not occupations, has grown.

(4) Two categories of health workers, those engaged in rendering psychological services and those directing attention to environmental problems, will not be addressed in the HPEMP. In part this decision has been made because educational programs in these broad categories prepare personnel for other occupational fields than those which are strictly health related; in part the decision reflects an internal Departmental work distribution decision. It is intended, however, that both the psychological services and environmental fields will be addressed in other parts of the third phase of the N.J. Department of Higher Education Master Plan.

At the same time we have attempted to make clear to all concerned that this is essentially a health professions education master plan, which it is hoped will enhance the quality of health care delivery. Ultimate responsibility for that desired goal, however important, lies elsewhere, and we must be careful not to raise false and undue expectations from our activities.

Major Objectives

The master plan, as presented in this document, encompasses six major objectives to provide the basis for the development of health professions education in New Jersey. These objectives are:

1. Develop an educational system whose processes and graduates will facilitate a team approach to the delivery of health services, wherever this service mode is feasible.

2. Establish the principle that the higher education community is a full, active and responsible partner in the decision making and information processes affecting the future shape of health delivery systems; similarly in the accreditation, certification and licensure processes governing the approval of training programs and the practice, utilization and mobility of health professionals.

3. Identify pedagogic approaches which can contribute to the development of successful programs and practitioners; establish qualitative and consistent program essentials which should animate the various occupational curricula; develop further the possibilities for career mobility by encouraging the introduction into the educational process of such concepts as task analysis, subject (or unit) modularization, core curricula, program clustering, etc., where it can be demonstrated that these approaches are viable and qualitatively superior.

4. Affirm the primacy of clinical experience in the health professions education programs, and establish standards and mechanisms to assure both the quality and the rational use of available facilities in the State.

5. Make possible the efficacious use of human, physical and fiscal resources by developing a matrix to guide state-wide and institutional decisions regarding the numbers and types of health personnel we should be educating in the future.

6. Create an advisory mechanism for planning, program review and approval, evaluation and maintenance of standards, in the health professions education fields.

In addressing ourselves to these six objectives we have tried to reflect the continuing search for balance between the levels of preparation and retraining of health personnel, and their performance of duties. We have called for modifications in existent educational curricula: to reflect changing demands for types and levels of health workers; to include additional areas of study and specialized training; to foster career mobility and professional upgrading; to provide opportunities for post-graduate, continuing and in-service education; to encourage recruitment and retention of personnel, particularly from the educationally disadvantaged and minority population groups; and to create career ladders and promote the use of proficiency and equivalency examinations.

In the chapters on research and retention and mobility of students we have specifically identified the need for an interdisciplinary approach in educational, investigatory and demonstration efforts undertaken by our colleges and universities. Factors affecting health care and maintenance are extremely complex and we concur with the need to deal with not only the medical, but also the major economic, social and environmental aspects of health matters.

It also will be noted that a fundamental assumption of the HPEMP is that the shortage of such prime professionals as physicians, dentists and pharmacists cannot be met merely through increasing their numbers; auxiliary personnel must be properly trained and permitted to take over aspects of their traditional duties. While trends in this direction are already evident both in New Jersey and the nation as a whole, the HPEMP makes explicit planning decisions and recommendations towards this end.

In addition, the HPEMP reflects the growing recognition that the wide array of health professionals must jointly undertake responsibility for health care. The team approach to health care is foreseen as a major (although not all-pervasive) characteristic of future health delivery systems, and must be prefigured in the educational preparation of personnel if it is to be properly realized.

We discuss and encourage the development of core curricula, program clustering in related fields, and regionalization of programs -- because of their reinforcing contributions to professional mobility, educational quality, and the efficient use of human and physical resources. We are concerned about the availability and quality of the clinical components of the health professions curricula, and propose a mechanism for peer evaluation to supplement and fill the lacunae left by the activities of the professional accrediting organizations and licensure agencies. Finally, we propose the initiation of activity to increase the teaching competency of health professionals, whose subject matter experience alone does not necessarily equip them to function effectively in teaching-learning situations with varied student bodies with different, and sometimes indifferent, academic backgrounds and competencies.

The basis of the HPEMP's manpower forecasts is contained in the December 1971 Report of the Health Manpower Data Project of the N. J. Department of Health, "Health Manpower in New Jersey". Hereinafter referred to as the HMDP, that report constitutes Appendix E of this plan. Having been developed jointly, at least in conceptual terms, by the Departments of Health and Higher Education, it constitutes an intrinsic and fundamental tool of the HPEMP. Changes in the methodology, assumptions and data of the HMDP must alter the HPEMP; it is anticipated that new directions, emphases, priorities, etc. in the master plan will likewise be reflected back into the future activity of the Health Manpower Data Project. A hope for the future is that the Comprehensive Health Planning Office of the Department of Health, which carries ongoing responsibility for the HMDP, will be capable of computerizing this material to afford rapid responsiveness to changing data inputs, and to provide timely print-outs for educational program planning purposes.

With respect to the quantitative aspects of the HPEMP, wherein we attempt to project manpower needs and hence institutional responsibilities for the preparation of additional personnel, we are at this stage building upon what might be characterized as a "modified status-quo" approach. Since the HMDP fully explains its methodology and assumptions, suffice to say here that we believe its strength resides in the fact that wherever possible, it is New Jersey data and trends upon which it builds its projections and forecasts future needs (even to the county level). Moreover, while it is the current status of health personnel staffing which forms the base for future need projections reflecting population and real income growth, present unmet needs and the anticipated consequences of the passage of national health insurance legislation also are subsequently built into the projections of future personnel requirements. In each and every instance, methodological and data assumptions and sources are clearly identified. Any exceptions, corrections, additions, etc. to these which are found compelling, and which challenge the integrity of our subsequent conclusions, will be incorporated in ongoing revisions of the HPEMP. Similarly, we will modify, correct or discard material found unacceptable in Chapter X of this plan, which builds upon the HMDP to assess the implications for institutional program responsibilities in each of the occupational categories discussed.

It will be noted that use of generalized national data, or simple ratios of personnel to population, is avoided in our forecasting. Not only do we find such data and ratios often in disagreement, if not flatly contradictory, but they are seldom buttressed by explicit or convincing analyses of how they were derived, and can rarely be viewed as properly expressing the situation in New Jersey.

We recognize that the methodology developed jointly by the Departments of Health and Higher Education makes no fundamental attempt to identify the health care delivery system of the distant future, and to project from that model the anticipated manpower needs in the various health occupation categories. This decision was arrived at on the basis that neither is there precise knowledge, nor agreement among acknowledged experts in the field, as to the lineaments of such a future delivery system. We do believe we should not engage in abstract prophecy as a means of inventing the future. We have avoided departing from observed behavior, or engaging in generalizations which, while perhaps realistic and referential at the outset, begin to take off into an idealized conception of what we regard as desirable.

In addition, given the resources available, we found ourselves incapable of quantifying the numbers of personnel who would be needed to staff such a future delivery system, even were it possible to satisfactorily agree upon its major and minor characteristics. Moreover, in view of the evident difficulties of authoritatively establishing the numbers of personnel required to staff even the existent health delivery mechanisms, we believe our approach is both prudent and realistic.

We believe, finally, that the existence for the first time in the State of New Jersey of an elaborated matrix of data and methodology assessing the needs for health personnel to staff our current health care facilities, will facilitate the development of a more future-oriented plan. Much credit for this is due the Department of Health and its Comprehensive Health Planning Division, and we look forward to continued collaboration with that Agency.

In addition to the development of qualitative and quantitative recommendations, we have also addressed the critical question of implementation. While the conception and gestation of any plan is important, the failing point of many planning efforts can be attrbuted to a lack of follow through during the time of implementation. This report is concluded with a chapter describing how the Health Professions Education Advisory Council will function as a stimulus for the cooperative planning needed to carry out the intentions of the adopted plan.

Finally, we are only too aware of the lacks in both the qualitative and quantitative aspects of this study. While the former are easier to correct, we shall endeavor to improve upon every aspect of this Master Plan with the assistance of responsible and informed commentary.

Our decision has been to build a planning model which, if less than perfect, nevertheless constitutes a more accurate framework for future decision making than any presently available to us. The alternative would be to refine the material until such time as the last bit of pertinent data is available, much like waiting for the "perfect wave" in surfboarding. That we regard as unacceptable.

CHAPTER II

TEAM CONCEPT OF HEALTH CARE DELIVERY AND THE EDUCATION OF HEALTH PROFESSIONALS

For years it has been the belief of physicians and dentists (and their patients) that only they could deliver personal health services. All other professionals, including the nursing profession, felt subservient to the physician's actions and his direction. However, the present system of health care delivery is gradually changing in orientation from one of emergency, or illness, care of the patient, to one of preventive care, or health maintenance. In this altered context, and given the fact of increasing specialization among health care professionals, many physicians have become aware of the need to reorient both their own thinking and that of their patients.

Physicians will, of necessity and rightfully, remain the focal point of major aspects of health care delivery by virtue of both their expertise and technical training. However, other health care personnel can direct the activities of health care institutions and can and should function in substantially strengthened and often leadership roles.

In order to develop the rational use of health care manpower and resources, there must be a careful delineation of the activities and responsibilities that can be discharged by various members of the "team", and the circumstances under which these responsibilities and activities are appropriate.

One possible pathway of evolution in the future would be to develop self-contained units of health care providers. Those would include physicians, dentists, nurses, many of the allied health professionals and managers. The members of these teams would have designated responsibilities which they would discharge to the patient, or in support of patient care activities. The team leader might in one case be a nurse, the next a physician, and in another an administrator.

Hildegard Peplau of the Rutgers University Graduate Program in Advanced Psychiatric Nursing and immediate past president of the American Nurses Association has provided definitions for two kinds of teams:(1) intraprofessional teams which include professionals and their assistants from within a specific discipline; or interprofessional teams which include two or more different professional disciplines and their assistants. She indicates that the health care team should be organized for the purpose of accomplishing the work required with economy, efficiency, full utilization and continuous upgrading of the competencies of the team members. The focus of the team should be on the problems, needs, and concerns of patients and clients and upon continuing refinement of the process of team functioning through which client concerns should be resolved or ameliorated. The process should include such operations as assessment, establishment of a health care plan, identification of authority and responsibility of members and the work of each in carrying out the plan and the reporting, evaluation and follow-up. In some health care facilities the Problem Oriented Medical Record system becomes a central instrument to integrate the team's process.

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(1) "The Team Concept in the Practice Setting: A Nurse's Viewpoint", Hildegard Peplau, R.N., Ed.D., prepared for discussion at the DHE Conference on Team Concept, October 6, 1972, New Brunswick, N.J.

Dr. Peplau has also indicated that certain variables other than the relative well-ness of the patient determine the structure and functioning of a health care team. She suggests that the following factors have a contributing effect on the way in which the team will function: the duration the members of teams interact as a functioning unit; whether or not the chain of command is hierarchical or collegial; and the extent of coordination between members over time.

Christian M. Hansen, M.D., member of the Department of Community Medicine of the Rutgers Medical School, CMDNJ, indicates that in his experience, with health teams in such primary care areas as Neighborhood Health Centers, a wide variety of professionals worked together to develop and implement a health plan for individuals and families.(2) Hansen's experience was that "for the first time pediatricians were talking to internists, and social workers to public health nurses, and even though there were problems in understanding the other's role and point of view, in many instances a new dialogue was started." The team members have felt that the extra effort required was worthwhile; and in addition to favorable responses to the team approach by patients, there has been an increase of about 40% of the residents who have had physical examinations in the absence of any known health problem, as well as increasing numbers of patients who seek early diagnosis and treatment for specific symptoms.

Edmund Pellegrino, M.D., Vice President for Health Services at SUNY, Stony Brook, has indicated that the mandate imposed by modern society on all its health professionals is to deliver the health care which is becoming a civil right of all citizens.(3) While the mandate derives from an increasing assessment of the capabilities of medical science and technology, it also serves as the criterion on which public support and acceptance of the health care establishment will be based. The present system, however, fails to allow each health profession to make its optimal contribution to an integrated system. Without the removal of this impediment the mandate cannot be fulfilled. Pellegrino indicates that the resolution is a situation wherein all health professions must voluntarily engage in a new relationship with each other, on a continuing basis: "a genuine interprofessional effort of ecumenic dimensions", with the outcome the "emergence of a unified health profession, rather than a disparate series of competing professions, with the subdivisions built around the needs of patients and communities, not boundary lines of status and self-assured superiority."

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(2) "A Physician's Experience as a Member of a Family Health Team in an OEO Neighborhood Health Center", Christian M. Hansen, M.D., prepared for discussion at the DHE Conference on Team Concept, October 6, 1972, New Brunswick, N.J.

Dr. Pellegrino indicates that "the physician would be captain of the team when the major needs are for diagnosis and critically important or sophisticated techniques. But when other needs are dominant, as in chronic care and preventative or rehabilitative medicine, other health professionals may quite justifiably assume a primary role for variable periods of time." He adds that better interprofessional relationships would be fostered by providing educational experiences in team leadership as part of undergraduate and continuing medical education.

Carried to its logical, and hence implausible extremes, such a system calls for the training of all members of the team in identical environments so that they would recognize, respect and understand the expertise, capabilities and limitations of one another. Realistically, it minimally demands a coordinated educational system, in which the training of all our health care professionals takes place in compatible pre-clinical and clinical settings committed to the team concept. The pre-clinical classroom portion would of necessity be decentralized to various academic facilities chosen on the basis of institutional strengths, maximal utilization criteria, faculty concentration, etc. Nevertheless, the creation of such a system calls for a high degree of standardization of experience and exposure, an organic coordination of the pre-clinical and clinical courses, and a further rationalization in the use of resources generally.

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(3)"Closing the Profession Gap - Some Notes on Unity of Purpose in the Health Professions," Chapter 19(pp. 212-219) in McTernan, Edmund J., and Hawkins, Robert O., Jr., editors, Educating Personnel for the Allied Health Professions and Services(St. Louis, Ill.: C.V. Mosley Co.), 1972.

Eleanor Brunetto and Peter Birk describe one model of a multidisciplinary primary care team operating in a community health center.(4) Independent, interdependent and dependent functions -- related to the level of authority and decision-making involved, and depending largely on the extent of well-ness of the patient -- are detailed. The problem oriented record is, again, emphasized as being an important mechanism by which to facilitate increased participation by all members of the health care team.

With a problem, or patient - oriented approach (rather than one that focuses on the occupational group or hospital service department providing the care, analysis or treatment), each person who performs work for the patient can understand the rationale for that particular aspect of care. A greater understanding of the basis for care also should enable each team member to contribute observations and suggestions in a more useful and meaningful way.

In practical terms to be sure, it is most unlikely that this goal of the new health care team can be perfectly accomplished in all its aspects. The sheer scope, quantity, and necessary dispersion of physician, dentist, pharmacist, allied health, nursing programs, etc., required to meet the demand for such personnel, lies beyond the capacity of any single institution to provide all students with integrated clinical experiences. However, colleges, universities and the medical and dental schools faculties should participate in cooperative efforts to design the pre-clinical portions of the health professions' curricula in close support of clinical team care concepts. Wherever team integrated clinical training is feasible, moreover, the medical and dental students will certainly benefit from an increased understanding of the preparations and abilities of other health personnel. These latter professionals, and the programs at the undergraduate institutions in which they are enrolled, in turn could benefit and be strengthened by this close relationship with the medical and dental schools. Where such joint programs are possible, finally, they will serve as demonstration models in support of team concepts in health care delivery and education, which should benefit all other programs in related fields in the State.

Throughout the remainder of this plan, it will be observed that the team concept constitutes a major if not all pervasive philosophical underpinning and integrating force. It animates, reinforces and ties together many of the positions adopted and recommendations advanced subsequently. The issues addressed in the chapter on Accreditation, Licensure and Certification assume the utmost flexibility in utilization of health care personnel. The team concept underlies the assumptions in the chapter on Retention and Mobility of health personnel in that as health workers feel themselves a part of a significant enterprise they are most apt to be productive, continuing participants in the health care work force.

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(4) Eleanor Brunetto and Peter Birk, "The Primary Care Nurse - The Generalist in a Structured Health Care Team," AJPH, June, 1972, Vol. 62, No. 6, pp. 785-794.

To the extent that we can identify the structure of the health care team, we will be better able to address the elements of sound core curricula. And in the utilization of clinical facilities, we should be increasingly aware of the future mixes of health care teams so that professional associates can come to understand their separate and overlapping responsibilities and their mutual interdependency as they gain appropriate experience in their own discipline.

Potentially, future health manpower models can postulate alternative mixes and ratios of health care professionals, one-to-the other, so that projections can be based on the potential realities of the work situations. At the moment, there are many alternative models and mixes of health care workers operating in various settings and for various durations of time. One early objective is to document the relative frequency of the various structures of health care teams so optimum educational and clinical structures can be derived. Some probable advantages and disadvantages to the team approach have been hypothesized; issues have been raised and some areas for research suggested.(5)

Probable Advantages

1. Usually, three different "rites de passage" are necessary in the medical professions: orientation to the occupation, to the setting, and to the team practice situation. If the training is in a team structure, one of these transitions may be alleviated, but only if the practice setting is similar to the education setting.

2. The specialist, and all team members, can be more efficient with learning time -- it should be possible to learn what it is not necessary to be responsible for, and what specific things other members of the team will be handling. Respect for and understanding of the problems, knowledge and skills of other disciplines could result.

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(5) "Notes on Team Approach to the Education of Professionals", C. Farlee, DHE. See also John J. Horowitz, Team Practice and the Specialist (Springfield, Ill: Charles C. Thomas, 1970).

3. It may be that certain costs of medical care could be reduced, at least by the factor of consultantships for verification by other specialists. If the team has the necessary skills and resources within it there should not have to be additional consultant fees.

4. Tasks that are now frequently overlooked and not performed may be able to be handled routinely. (The consequence may be a temporary increase in medical costs as more team members are needed to serve patients, provide them with health information, etc., but an overall decrease in costs, per patient, as levels and understanding of health rise.)

5. Record keeping may have to become more systematic in order to achieve optimum coordination between members of the team. A possible positive outcome of the more systematic recordkeeping is the improved quality control over the output and performance of members of the team.

Probable Disadvantages

1. The variety of present teams and structure of work situations is so broad that (a) not enough is known about the most frequently found practice structures and (b) if the student is oriented in one type of team structure and practices in another, certain outcomes that were thought to be advantages might well be disadvantages. For example, a student team member may decide it is not necessary to have certain skills or knowledge because other team members have those abilities. However, those other skills may not always be present, or other team members may have learned that certain tasks are clustered in the first member's role.

2. Specific definitions of rights and obligations may be ambiguous; boundaries may be unclear; transitions between teams educated with different structures and assumptions may be difficult. Reciprocity between team members may be lacking or not feasible as when persons in roles usually designated to carry out orders ask (consultant) advice of a "superior": does the "superior" have a duty to explain the rationale for the presented treatment?

3. Currently, professional/occupational associations provide orientation, support, certification and identity. With team education, the identity will probably tend to lie with the team, but it is questionable whether all team colleagues will hold similar or compatible professional values and goals. Heterogeneous backgrounds, with different value assumptions, may have negative (as well as positive) consequences for functioning of the health care team.

4. There is a series of problematic issues that could produce advantageous or disadvantageous outcomes. Examples of these issues include such things as: the type of leadership, the nature of the division of labor, the extent and effectiveness of peer and patient review, and alternative career patterns in inter-disciplinary teams.

Research

Research components should be included in any (demonstration) programs involving team education projects. The crucial dependent variable would be the provision of service to clients; clients, not services, would be the research case for analysis.

Independent variables, to be incorporated in the complex research designs would include controls for types of team (size and composition), setting type, as well as different types of learning situations and assumptions.

Process, or situational (intervening) variables to be considered include the types of decision-making interaction in the team, the extent to which jobs and hierarchies are specified, the degree to which expectations of output are enforceable.

Output, or goals variables include in addition to client utilization and satisfaction, indicants of productivity, efficiency, and objective measures of adaptation to change.

Research hypotheses should be developed to predict best outcomes from different structural situations built into the quasi-experimental design.

The team concept of itself still remains to be fully specified by the health profession itself. Therefore, if this concept is to be adopted and where applicable become integral to health professions education in New Jersey, the concerned faculty and administrators at our colleges should fully explore the ramifications of the team approach.

Recommendation #1 - Investigations should be made of the alternative structures of teams to determine optimum ways in which the team approach can be integrated into the educational process. In cooperation with health occupations educators and practitioners, the Department and HPEAC should develop the following specific position papers to animate and be adopted, where indicated, by our health professions programs:

A. How the introduction of the team health care concept changes the traditonal hierarchical structure of medical and *dental practice, harboring potential for improved patient service, while also potentially introducing certain new limitations and problems.*

B. The functions and methods of initiating health care teams: the experience and composition of existent team efforts; identification of new possibilities for health care team activity.

C. Explicit methods for training health professionals in group process and interprofessional care, which presumably must result in a reworking of some of our present educational objectives.

It is acknowledged that the above recommendation would constitute only a first step toward identifying team groups and students for program purposes. It is not possible or feasible to identify the specific teams any more precisely at the present time in the health field.

On the other hand there is, in the field of dentistry, a rapidly progressing yet stabilized delivery team which can be readily identified. The dentist now has a hygienist and an assistant, both of whom are becoming increasingly involved in patient treatment. Under the supervision of the dentist, it has been shown that both can be delegated particular intraoral procedures which they have been trained to perform. Utilization of dental auxiliaries in this manner has been proven to be effective and it now rests with our educational institutions and professional associations to develop appropriate training and practice opportunities. It is, therefore, recommended that:

Recommendation #2 - The dental educators, both professional and auxiliary, within the State begin to develop, with professional consultation and support, appropriate educational programs which will demonstrate the dental team concept as an integral part of each dental professional's training.

CHAPTER III

ACCREDITATION, LICENSURE AND CERTIFICATION:

factors affecting manpower availability

Credentialing of health personnel has a direct and significant effect on the nature and the supply of health manpower. The three aspects of approval-granting are closely allied and for the sake of clarity accreditation, licensure and certification will be defined at the outset and then reviewed.

"Accreditation - the process by which (a nongovernmental voluntary) agency or organization evaluates and recognizes an institution or program of study as meeting certain predetermined criteria or standards."

"Licensure - the process by which an agency of government grants permission to persons to engage in a given profession or occupation by certifying that those licensed have attained the minimal degree of competency necessary to ensure that the public health, safety, and welfare will be reasonably well protected."

"Certification... - the process by which a nongovernmental agency or association grants recognition to an individual who has met certain predetermined qualifications specified by that agency or association. Such qualifications may include: (a) graduation from an accredited or approved program; (b) acceptable performance on a qualifying examination or series of examinations; and/or (c) completion of a given amount of work experience."(1)

Although these functions are not within the purview of the Department of Higher Education, all of them have a direct and profound effect on the production, demand and practice of health personnel. At the very minimum, as suggested by the Health Manpower Data Project, improved standardized registration, certification or licensing procedures for health personnel would provide an efficient means of accurately collecting and updating data and assessing the pool of qualified professionals. Implementation of many of the recommendations contained in the Report on Licensure and Related Health Personnel Credentialing submitted to the U. S. Congress in July of 1971 by HEW Secretary Richardson, would go much further and likely contribute to easing the health manpower shortage and improving the quality of care.(2)

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(1) DHEW Publication (HSM) 72-11, June 1971 "Report on Licensure and Related Health Personnel Credentialing". p.7.
(2) *Ibid*.

Prepared by Ronald J. Wylie and Harris S. Cohen, this 150-page report is one of several current attempts to sort out health manpower problems in this sphere. Among its recommendations are several which are specifically endorsed by this plan:

1. A two year moratorium be imposed on the enactment of legislation establishing new categories of health workers with narrowly defined scopes of practice. Rather, attempts should be made to broaden existing health practice acts which would extend and provide for delegation of authority.

This mechanism is currently being utilized by some states to permit the practice of physician's assistants.

2. National Examinations, such as those used by nursing, should be developed to provide a degree of uniformity among the graduates. Also, the creation of proficiency and equivalency examinations is called for to broaden career opportunities for those with other than standard qualifications.

3. Increased coordination and liaison is advocated between licensing boards and other governmental health agencies responsible for the planning and overseeing of health service, with the inclusion of consumer representatives on these licensing boards.

4. Re-credentialing of practising personnel, beyond the initial approval, is proposed to assure that levels of competence are maintained.(3)

Although these recommendations establish an agenda for future implementation, the Report also addresses actions which will be undertaken immediately to help resolve present credentialing problems.

1. Creation of a focal point in the Secretary of HEW's office for policy coordination and implementation of credentialing activities;

2. Continuous review of HEW programs to achieve desired objectives with regard to personnel standards, job opportunities, and career development;

3. An accreditation study one of whose alternatives might be the possible establishment of a public corporation to promote national coordination of accreditation;

4. A feasibility study of a national system of certification for selected health personnel categories.(4)

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(3) Ibid pp. 73-77
(4) Ibid pp. 71-72

The Report notes that the original intent of licensing procedures was "to protect the public from dishonest and incompetent practitioners", but that secondary effects have since surfaced which, on occasion: "limit the number of practitioners by imposing unnecessarily difficult requirements as conditions for obtaining a license". It adds that "licensure ... does not necessarily mean that the state has evaluated the profession's standards and has approved these standards as being valuable to society".(5)

Finally, the Report calls for the establishment of demonstration projects of "institutional licensure". One approach to this concept, developed by Nathan Hershey of the University of Pittsburgh Health Law Center, is based on the theory that only solo practitioners need licenses. Employees of health delivery centers would be certified by the employer.

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(5) Ibid, page 2.

Question has been raised whether the shortcomings of present licensure processes, as discussed in the Richardson Report, can be further substantiated. A lenghty analysis and bibliography is contained in "A Model Practice Act, Designed for Applicability to the State of Vermont," November 29, 1971, by Gary J. Clarke, Eagleton Institute of Politics, Rutgers University. The AMA's Department of Health Manpower, in an undated though recent analysis entitled "Licensure of Health Occupations," lists and describes the following limitations and/or characteristics of occupational licensure:

-"...a growing body of opinion that occupational licensure has outlived its usefulness as a method of assuring quality health care services."

-"Proliferation in mandatory occupational licensure laws tends to foster a 'craft union' approach to health care, and may lead to unwarranted increase in cost of services."

-"Current occupational licensure laws tend to inhibit innovation in the education and use of allied health manpower, and restrict the avenues available for entry into or upward mobility in a health career."

-"Licensure of an allied health worker does not, per se, protect the physician or institution employing that worker from liability."

The HEW Report is, of course, not the only significant initiative in this now intensively studied field. A Study of Accreditation of Selected Health Educational Programs (SASHEP),(6) directed by William K. Selden and sponsored by three national professional and educational organizations, is a study undertaken by the medical profession and academic institutions "to consider the most effective ways to assure that allied health personnel will be adequately prepared to meet their practice responsibilities".

Quigg Newton, President of the Commonwealth Fund which provided financial support for the SASHEP project, has commented that health professions education "is being seriously encumbered by the costly maze of accreditation requirements and procedures imposed by the multiplicity of professional associations that characterize this important health manpower sector. The public interest requires that a means be found to promote collaboration between professional associations and allied health and educational institutions in these fields in an effort to create a new system of accreditation that will make possible a coherent, flexible and rational approach to manpower development".(7)

A specific SASHEP recommendation calls for the creation of a Council on Accreditation for Allied Health Education. This new Council is seen as assuming responsibility for accreditation in the fifteen fields subject to final approval by the AMA at the time SASHEP was initiated. (There are now over twenty such fields subject to accreditation by the AMA on a collaborative basis.) The Council would also be responsible for curriculum analysis, approval of standards, research relating to evaluation of programs, and liaison with certifying and licensing agencies. Some of the fundamental changes in the approach to accreditation which also were proposed are: 1) multi-disciplinary site visit teams; 2) greater responsibility for the quality of clinical preparation; and 3) more rigorous procedures for accrediting free standing hospital and laboratory training programs.

Here in New Jersey, the January 1971 Report of the N. J. Professional and Occupational Licensing Study Commission, chaired by Senator Raymond H. Bateman, made several recommendations which anticipated the above HEW report, including the incorporation of public and state government representatives on licensing boards. Chapter 60 of the N. J. Statutes for 1971 redefined the memberships of a significant number of state licensing boards in the health personnel area to include such additional persons.

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(6) Parts I and II: Staff Working Papers, and SASHEP Commission Report, Study of Accreditation of Selected Health Educational Programs, 1971 and 1972, SASHEP, One Dupont Circle, Washington, D.C. 20036.

(7) Ibid.

In February 1972 the Chancellor of Higher Education, Ralph A. Dungan, was appointed to the State Board of Medical Examiners. The Department has worked closely and intensively with that Board to evolve an equitable process to permit graduates of foreign medical schools to undertake internships in New Jersey hospitals and subsequently obtain their licenses to practice. Efforts in behalf of foreign dental school graduates also were undertaken with the State Board of Dentistry, as well as a reexamination of the requirements that Board imposes for admission to dental hygiene programs. It is clear that there is a need for continuing coordination in program admission, educational and performance standards between licensing boards and the higher education community. A dramatic example of this approach can be found in the Department of Higher Education's recent agreement with the State Board of Nursing to establish a joint program approval procedure. This initiative is in the process of formalization by means of a working protocol aimed at eliminating conflicting standards, and duplicative approval and review procedures.

Above all, several commentators, among them Mr. Selden during a Departmental-sponsored conference on these issues, have urged that accreditation, licensure and certification be viewed and structured as companion processes in a systematic credentialing unity. He and Harris Cohen likewise noted that rationalization of these processes must be pursued in order to diminish the tendency to render individual practitioners obsolete as health care delivery changes; to lessen the cost of health care itself; to foster the best utilization of health manpower; and to contribute to raising the quality of the health care provided. Therefore, in view of the benefits which can be realized in the continuation and strengthening of the cooperative endeavors listed above, it is recommended that:

Recommendation #1 - The HPEAC should examine and recommend to the Chancellor and Board of Higher Education its support for the possible addition or inclusion of educational and consumer representatives on all state licensure boards in the health professions, in addition to appropriate practitioner and professional groups, and

Recommendation #2 - The HPEAC should similarly investigate and forward recommendations on the feasibility of formalized cooperative agreements with health professions licensing boards on matters relating to entrance requirements, program approvals, professional standards and the continual examination and revision of State Practice Acts and their accompanying rules and regulations.

There exist short-range and intermediate steps which realistically can be accomplished in this field. Therefore, in close cooperation with the State Division of Consumer Affairs and the Department of Health, it is recommended that:

Recommendation #3 - Among the additional objectives to be sought by the higher education community in its collaboration with accreditation, certification and licensing authorities, are exchanges of information and mutual identification of critical issues in such areas as:

1. *Curriculum requirements and program evaluation;*
2. *Qualifying examinations;*
3. *Clarification of licensure objectives and elimination of dysfunctional and restrictive requirements such as age, residency, sex and sponsorship;*
4. *Restructuring of current practice acts to permit expanded duties by certain professional groups;*
5. *Criteria and mechanisms of re-licensure;*
6. *Problems of public confidence, often related to charges of "guildism" on the part of accrediting, certifying and licensing agencies;*
7. *Licensure by endorsement;*
8. *Continuing education.*

It will be important to encourage greater interaction among different professional groups in the above activities, and to overcome the assumptive, non-cooperative approach towards licensure and practice considerations which some observers assert the medical profession has assumed.

It is believed that the continuing HEW and SASHEP efforts on the national level will clearly support the previous recommendations. Their specific findings should be closely reviewed by relevant agencies in New Jersey with a view to possible support and implementation where appropriate. It is certain, however, that much more must be accomplished in the State before the impediments associated with accreditation, certification and licensure are eliminated and their benefits for the maintenance of quality standards among health programs and personnel are maximized. The Department of Higher Education will continue to have direct and indirect effect on these changes.

The Department and the higher education institutions cannot, of course, play a dominant role in examining personnel for certification and licensure. Conflicts would be readily apparent between higher education's responsibility for the approval and conduct of programs, with those mechanisms responsible for establishing the competency of their individual graduates. The Department, with the advice and counsel of the educational institutions, nonetheless should seek to furnish serious and meaningful input to the decisions made by other governmental and non-governmental agencies charged with licensure and certification.

The areas for coordinated study outlined in Recommendation #3 represent initiatives towards an orderly, incremental process of change in the credentialing field. In addition, with respect to two other, admittedly controversial concepts, we believe it would be desirable to test their validity for New Jersey via intensive investigation. The first concerns the certification of personnel by academic credential. For this purpose it is recommended that:

Recommendation #4 - The HPEAC should identify and sponsor a study to investigate the long range implications, characteristics and results of a process for the certification by academic credential of selected health professionals. Evaluation procedures based on performance criteria, including feed-back from health provider agencies and consumers, should be incorporated. In the establishment of this project, the input and assent of relevant legislative bodies, governmental licensing agencies, professional accrediting groups, and provider organizations should be secured.

The second investigation concerns institutional licensure. We are cognizant of the fact that study projects are currently underway in various states. We will keep abreast of the progress and outcomes of these projects and build on their experiences. If successful, it is hypothesized that the approach would viably increase the scope of responsibility of certain health personnel. In the words of the HEW Report:

> ...The present system of personnel licensure specifies a given scope of practice beyond which the practitioner may not tread. This tends to provide a rigidity of structure and function that is not readily adaptable to rapid change -- an increasingly evident trend in health care. The institution providing health services, whether it be a hospital, clinic, neighborhood health center, or a health maintenance organization, may require frequent changes in its utilization of health personnel. Health-care institutions must have a

> great deal of flexibility in meeting the exigencies inherent in health services delivery. This flexibility is now seriously limited by the present system of personnel licensing.
>
> The primary thrust of institutional licensure then, is to replace the licensing of individual practitioners presently working in institutional settings with a single license to the institution. (8)

The HEW Report further cites Hershey's approach to operationalizing this form of licensure:

> The state hospital licensing agency could establish, with the advice of experts in the health care field, job descriptions for various hospital positions, and establish qualifications in terms of education and experience for individuals who would hold these spots. Administrators certainly recognize that although a professional nurse is licensed, her license does not automatically indicate which positions within the hospital she is qualified to fill. Individuals, because of their personal attainments, are selected to fill specific posts. Educational qualifications, based on both formal and inservice programs, along with prior job experience, determine if and how personnel should be employed.(9)

It is this Department's belief that this concept, which we will call "organizational certification" of qualifications (or institutional supervision of the health worker) has validity for the credentialing of certain levels and types of health professionals, and that individual licensure as well as educational certification should also continue as valid alternatives to credentialing. It is, therefore, recommended that:(10)

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(8) Op. Cit., p. 65

(9) Nathan Hershey, "An Alternative to Mandatory Licensure of Health Professionals", Hospital Progress, 50 (March 1969). See also, Nathan Hershey, "The Inhibiting Effect Upon Innovation of the Prevailing Licensure System", Annals of the New York Academy of Sciences, 166 (December 1969), 955.

(10) It should be noted that this recommendation does not refer to certification of individuals to teach in an educational institution, which responsibility has, of course, always been the prerogative of the colleges and universities.

Recommendation #5 - *Investigation of the validity of the health service "organizational certification" concept, as an alternative to current individual health professional licensure procedures should be encouraged by the HPEAC. Support should be sought for study which would incorporate criteria and mechanisms for evaluation of the concept. The many questions which critics of the idea have raised must be addressed, as well as the need for appropriate institutional exemptions from the various practice acts. It will be important to secure the input and assent of legislative, governmental licensing, professional accrediting groups and provider organizations in the design and implementation of the project.*

Among the varied and serious questions regarding the organizational certification approach which should be addressed by such a study are:

1. Problems of credential transferability as the health professional shifts employment among organizations or employers; this will be particularly relevant with respect to reciprocity between states.
2. The considerable variance among health service institutions in their ability to assess professional competency.
3. Evaluation procedures as to whether and how organizational certification actually increases the scope of responsibility of health personnel.
4. Determination of the feasibility of governmental licensing agencies exercising necessary surveillance responsibilities.
5. Examination of the dangers of perpetuating or creating new problems rather than reducing constraints on flexibility and innovative use of manpower.

In conducting the investigation called for in the above recommendation, there must be a clear delineation of those situations where organizational certification cannot be applied. This would be the case with the considerable numbers of health personnel who are solo practitioners as well as those who are employed neither by a health provider agency nor another health professional. Nor should it be implied that under this approach the hospital administrator, for instance, would be sanctioned as a "divine presence" capable of solely defining all and specific service functions. Finally, in recommending such a project we are cognizant that it does not represent a quick and easy solution to the many problems besetting health professions credentialing, and that even should the approach prove feasible, its implications can have effect only over the long range.

We do feel it constitutes a promising opportunity which can shed meaningful light on some of the difficulties and inconsistencies of current licensure practices. It offers an opportunity for the elaboration of effective standards and criteria regarding personnel performance geared to their "outputs" as well as those "input" concerns which characterize present credentialing processes. A major merit thus lies in providing new ways of measuring and regulating health service institution activities not otherwise available today. Finally, the team concept discussed in the previous Chapter of this plan would be facilitated by the institutional licensure approach.

In addition to all of the above recommendations, there is the need to guard against tendencies for mere status seeking in accreditation measures. The higher education community must itself forestall the creation and insistence upon the collection of false academic credentials. Self policing will be needed to guard against the temptation which fosters ever higher credentialism in the interests of expanding the hegemony of higher education institutions over entrance into the various levels of health employment. As has been described in another context, "a trend which sends prospective plumbers into the intricacies of hydraulic engineering in order to qualify to perform a change of washers has to be resisted".(11)

As a final recommendation, which offers a means of tempering these temptations as well as accomplishing related objectives, it is believed that the Health Professions Education Advisory Council should serve as the forum and mechanism through which the higher education community can best focus its contributions in this area of concern. It is unfortunate that the exigencies of collegiate representation, plus the need to include employer, community and consumer representatives, as well as those from the various health planning and coordinating agencies on the HPEAC, do not also permit continuous participation by the multitude of professional organizations in that agency's deliberations. Discussions in Chapters VI, XI, and XII, however, demonstrate that additional mechanisms are being developed and recommended which will insure the receipt of necessary imput from such groups in the deliberations of the higher education community. Moreover, it is recommended that:

Recommendation #6 - Representatives of the appropriate State professional and licensing bodies should be invited to participate in the deliberations of HPEAC subcommittees when major issues and policies in the credentialing area relating to their fields of interest and responsibility are discussed.

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(11) Report of the Curriculum Study Committee, Association of American Law Schools, as reported in the Chronical of Higher Education, Vol. VI, No. 13, January 13, 1972.

CHAPTER IV

RECRUITMENT, RETENTION AND MOBILITY

The delivery of health care in the United States is said to have become the nation's second largest industry. Whatever the validity of that assertion, few would disagree that we can look forward to a continued and possibly explosive growth of the health industry in the future. As the demand for more extensive health care resources grows, and the concomitant need for a larger labor force, our present and potential manpower pool will be severely strained.

Some idea of the dimension of this requirement is contained in the U.S. Public Health Service estimate a few years ago that through 1975 a net increase of 100,000-130,000 conventional health workers will be needed annually. If correct, this would represent a 50 percent increase over the previous decade. The PHS projections beyond 1975 are even more staggering. While we shall be developing our own projections on health manpower needs in New Jersey, the PHS forecasts are at least suggestive of the scope of the problem.

The task at hand will be to recruit, train and effectively deploy health personnel to meet these demands. This calls for the coordination of a great variety of activities. In the previous chapter we discussed the need to change and make more flexible the ways in which we accredit, certify and license educational programs and personnel, to remove such unnecessary constraints as presently exist upon their efficient use. In this chapter we will address methods for mobilizing all segments of our population in the effort to provide qualified personnel in sufficient numbers; and identify mechanisms to encourage health personnel to remain active and productive.

Again it must be noted that effective utilization of human resources in the health field has been hampered by real or inferred obstacles in the employment setting. Many jobs are dead ended; personnel often serve with little hope of self-improvement, whether professionally or financially; morale and dedication, and ultimately patient care, suffer. Those of us responsible for the educational preparation of health personnel do not control and cannot fully accomplish all of the reforms necessary to correct this situation. But neither are we utterly bereft of influence.

A. Special consideration: the educationally disadvantaged

The problems to be discussed below are those which in reality apply not only to the educationally disadvantaged, but to the whole manpower pool and current methods for its recruitment, training, and employment. Issues such as sex discrimination, career ladders, counseling, curriculum reform, personnel motivation, etc., are problems whose solution will benefit workers in the health care field as a whole. Nevertheless, this plan affirms that extensive recruitment and training of the educationally disadvantaged for careers in the health professions is imperative if the nation is to fulfill its democratic ideals, and if the needs of the public for high quality health care are to be met.

It is a fact that many students who are qualified for, or at least have the potential for health careers, have never realized that potential. This is even more true for students from educationally disadvantaged groups, and especially minority groups. It is, moreover, our assumption that the appalling statistics demonstrating the low levels of health care among our minority population sectors, are not unrelated to the underrepresentation of these groups in the health professions.

This tragic waste of human potential should be remedied by intensive efforts to recruit qualified students from these population sectors, and to provide them with realistic opportunities to pursue health careers training including bi-lingual remediation programs. Here in New Jersey a special mechanism already exists, the Education Opportunity Fund, which functions to generally assist disadvantaged students entering our institutions of higher education. Further targeted assistance also can be justified with respect to the health professions specifically. To the extent that educational programs can be designed and conducted to encourage the practice of health professionals in areas critically short of such personnel, moreover, special efforts should be supported.

Recommendation #1 - Continued support should be given to remediation programs such as those recently launched by the CMDNJ, to increase the number and success of minority group students preparing to become physicians and dentists. Other institutions are encouraged to design analogous programs in the other health fields with critical personnel shortages. Promising persons evidencing academic potential, interest and motivation, even though their background preparation may be deficient in some respects, should be encouraged to pursue health professions programs through the provision of remediation and other supportive services. Such remediation programs should insure that all students ultimately reach the same level of preparation and competence so that the delivery of health care is not adversely affected.

Recommendation #2 - The Council for Higher Education in Newark, (CHEN), in cooperation with the Department of Education and the Newark school system, should immediately explore the possibility of developing a demonstration project involving the establishment *and joint sponsorship of a high school program in the City which would concentrate on the science subject matter fields. Such a program can contribute in an important way to increasing the available pool of qualified minority group students entering the health profession programs in our higher education institutions. The faculties of the CHEN institutions should not only assist in the creation of appropriate curricula, but develop procedures to introduce such a high school's student body to the career challenges and opportunities available in the health professions.*

Recommendation #3 -

a. Similar projects and programs should also be considered in other areas of the State, on the basis of experience gained in the above demonstration project.

b. It is further recommended that high quality introductory science programs be further developed in junior high schools in the State as a further mechanism to achieve the above objective.

Recommendation #4 - In the educational environments established by health professions education programs, close attention must be given to sensitizing their students to the problems, challenges and opportunities of practicing in the inner city and rural areas of the State where critical manpower shortages exist. The HPEAC should give priority to proposed programs creatively attempting to respond to this need, particularly in the proposed location and utilization of clinical facilities.

The selection of Newark as the locus of such a demonstration project is fully in keeping with its status as the State's largest city, with the largest concentration of minority population groups. Students from other areas, however, should be considered for admission wherever feasible.

Little will be accomplished, moreover, if admissions requirements into the health professions programs are set so high or inflexibly as to preclude the entrance of the educationally disadvantaged. An example of recent progress is action by the N. J. State Board of Dentistry, following discussions with higher education representatives, to eliminate from their regulations certain restrictive course requirements for students entering dental hygiene programs. It is therefore recommended that:

Recommendation #5 - The Department, with the assistance of the HPEAC, should review all present admissions requirements to the health professions education programs and insure that they are neither artificially strict nor rigid. Appropriate action should be taken not only with State agencies, but substantiated appeals also should be directed to national professional accrediting groups, where it is determined that their standards are unnecessarily high or restrictive.

Recommendation #6 - Data on the minority group composition of health professions program applicants, admittees and graduates should be collected and furnished periodically *to the Department. It should not be inferred, however, that quotas be established regarding the representation of such students in these curricula.*

B. Special consideration: representation of the sexes

In addition to the just discussed underrepresentation of minority population groups in many of the health professions, another disparity in this country resides in the fact that males are virtually absent from such occupational categories as nursing, the therapies, and the dental auxiliary fields, while women are found in limited numbers in such fields as pharmacy, dentistry and medicine.

This issue of proportionality among the sexes in the health professions is the subject of a growing literature,(1) conferences, etc., which cannot be properly reviewed here due to limitations of space. It is the Department's impression, however, that all of the health professions would benefit from a better balance in their composition between males and females.

Increased recruitment of women into those professions where they are underrepresented has been justitifed in part by Dr. Leona Baumgartner of the Harvard Medical School, because they constitute "the greatest untapped pool of power for health service. . ." Commentators on this situation cite the statistics in the United States, in contrast to those prevailing throughout Europe and other parts of the world. For example, almost one of four doctors in the Phillipines, Finland, Israel and Thailand is female; in England and Wales one of six; in the USSR about three of four; in the United States a mere seven percent of physicians are female--" a figure so modest that it tops only South Vietnam, Madagascar, and Spain."(2)

In addition, it is the contention of many commentators that the quality of care presently provided (including growing doubts regarding the need for much of the surgery for women taking place today)(3) would be improved with the entrance of additional females into health practice. Again, there are matters involved here over which educational institutions can have only marginal influence. Consumer acceptance, length of working life, arrangements to facilitate the engagement of working mothers, representation on professional, peer group and utilization groups -- all of these and other questions remain to be resolved. It is our recommendation that:

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(1) Two useful reviews of the matter can be found in: "Women M.D.s Join the Fight", Medical World News, October 23, 1970, and; "Women in Medicine", by Carol Lopate, published for the Josiah Macy Jr. Foundation, by the Johns Hopkins Press, Baltimore, 1968.

(2) Medical World News, op. cit. It is acknowledged that these statistics are partially misleading in some cases. The figures for the Soviet Union, for example, include persons who in this country would more likely be classified as physician's associates than medical doctors.

(3) Ibid.

Recommendation #7 - All of our health professions programs should review the qualifications of their applicants without regard to their sex and include representatives of both sexes on their admissions committees. Data on the sex of their applicants, admittees and graduates should be collected and furnished the Department on a regular basis. Part-time internships and residencies, where applicable, should be explored and instituted where feasible. The Department does not intend, however, that any of these recommendations be construed as calling for the imposition of specific quotas regarding the proportion of the sexes to be represented in the student bodies of health professions education programs.

C. Recruitment

It is fortunate that in New Jersey an experienced instrumentality already exists to stimulate the selection by high school students of careers in the health professions, namely the N. J. Health Careers Service (NJHCS). The stated purposes of this voluntary organization are to "coordinate, develop, facilitate, maintain and promote programs and other activities calculated to stimulate interest and assist individuals in choosing and preparing for careers in the health field."

Since the date of its first contract in 1969 with the State Department of Health, it has conducted health careers workshops involving guidance counselors and teachers from the elementary, secondary, vocational and community colleges of the State; developed visual aids, bibliographies, newsletters, posters and other informational materials for guidance counselors, to encourage entrance into the health careers; conducted summer career orientation programs for students; and explored possibilities for expanding scholarship opportunities for students entering health professions education programs.

In addition the Urban Science Education Coalition (USEC) has been engaged for several years in an effort to assist collegiate institutions to accelerate their recruitment drives to include minorities and women in their student bodies, faculties and administrations. The Hospital Research and Education Trust (HRET) in coordination with the New Jersey Association of Hospital Auxiliaries also has assisted in health manpower recruitment through their "careers in Health Mobile Unit."

These activities are important and should be further supported by appropriate governmental, health care, and voluntary agencies. With the development of this master plan, moreover, an opportunity is presented to assist the NJHCS and USEC in further focusing and concentrating its efforts. It is therefore recommended that:

Recommendation #8 - A mechanism should be set up whereby the Health Professions Education Advisory Council and the Department can furnish continuing guidance to the NJHCS, USEC, HRET and other consumers of the Health Professions Education Master Plan. The occupational priorities and other emphases in this master plan, as well as subsequent updatings, should serve as guidelines for these recruiting activities.

Recommendation #9 - The NJHCS should be given additional support to accomplish its mission and should be encouraged and supported by the Department of Education and organizations employing health professionals since such agencies are the ultimate beneficiaries of the efforts of the Service. Greater emphasis also should be given in NJHCS activity to use of college personnel to describe available programs and career opportunities.

D. Retention and Mobility of Students

An unfortunate consequence of intensive recruitment is that after selection from a wide range of candidates with varied backgrounds, students are funneled into traditional, rigid curricula which are not adaptable to their varied needs and capabilities. In community colleges this quickly became characterized as the "revolving door" policy in that a number of students, although accepted into programs, were not retained through graduation. Another unfortunate consequence of inappropriate curricular design is the locking-in of students to a fixed career path soon after they have initiated their studies. Students who, after being in the program for some time, discover that they no longer wish to continue in this particular field are frustrated by this inflexibility and are usually obliged to continue through to graduation or simply drop out. Only the rare student had the courage and perhaps the resources to go partway through one training sequence then drop back to the beginning of another which he found to be more in line with his interests.

The solution to the above problems may well depend on the ability of the State's educational institutions to cooperate in the development of functional, yet flexible curricula built on the concepts of equivalency testing, core curricula and modular instructional units. The advisory mechanisms and related services of the colleges must be cogizant of the existence of these instruments, in addition to those of the secondary schools noted above. The final chapter of this document dealing with the plan's implementation, offers recommendations calling for greater cooperation between the colleges with respect to joint program planning and coordination.

It is our belief that a planned, sequential educational process can be developed which would link many if not most of the health occupations. This would require the establishment of broad standards of quality by the institutions. Functional task analyses of the duties, many of them common or closely allied, entailed in the various health professions, can be elaborated and curriculum cores and/or learning units identified to undergird the educational programs in this field. In short, it is both possible and indeed mandatory that we so structure our health professions education curricula that they can be built upon to provide students with the requisite background for lateral and subsequent vertical mobility in their educational programs. As has been recommended in other chapters, an interdisciplinary approach in educational, investigatory and demonstration efforts is needed to deal with the major societal and medical aspects of health matters.

In the lateral sense, career mobility within a specific field of employment can be exemplified by a general duty nurse receiving special training to assume responsibilities in a coronary care unit. Vertical mobility occurs when health workers acquire additional education and experience permitting them to progress upward in their profession, as when a dietary aide advances to dietician status.(4) One of the necessities, however, in the construction of such ladders (both educational and career) is that ascent be a relatively straight climb, without requiring students to backtrack and relearn material and techniques previously mastered. The following factors: equivalency testing, development of core curricula, and the modularization of instructional units, are particularly pertinent to the realization of this approach and will be discussed at further length.

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(4) Regarding mobility within a single profession or occupation, it needs be emphasized that the thrust of allied health workers should not be directed only to more prestigious occupations. Rather, job satisfaction, encouragement, and adequate compensation should be features of every job. Even the entry level job should be accorded sufficient challenge to encourage the person to stay in the health field. Status and dignity must not derive only from moving up into another health profession, since this would discourage fullest development in any allied health field, and would tend to deprive workers of intermediate steps of satisfaction. Entrance into other careers should be facilitated, but emphasis also must be placed on growth within each given occupation, and clear steps of internal advancement must be articulated. The worker whose life situation or capabilities prohibit him from taking advantage of opportunities for education, must not be consigned to a life of frustration, indignity or immobility, or have his necessary labor lost to the health enterprise.

1. Equivalency and proficiency testing

Some distinguishing definitions are in order. Proficiency examinations are designed to measure whether a person is competent in performing specific job duties. By objectively establishing the level of a person's skills, they help overcome barriers to employment and promotion. A returning veteran trained in the armed forces' program for medical technicians, for example, lacks credentials attesting to what many regard as high quality preparation. Proficiency examinations make it possible for such individuals to enter the job market not at the bottom of the ladder, but at a point appropriate to their previous training and experience.

Equivalency examinations, on the other hand, being based on the established curriculum for a particular field, are designed to grant college credits and thus advance standing in educational programs. It is these latter examinations which are of primary concern to this plan. By permitting students to receive credit for independent study, television courses, adult education courses, experience acquired through work which can be equated with material offered in formal educational programs, as well as other forms of learning outside the regular college environment, they likewise facilitate career advancement and development.

Only the surface has been scratched in the preparation of tests in either of these areas, and study is needed to determine whether the greater amount of material currently available with respect to proficiency testing is not transferrable to the field of equivalency examination.(5) The recent establishment in New Jersey of Thomas Edison College, whose purpose is to develop the external degree concept in this State, and equivalency testing instruments for use by all our institutions of higher education, offers an excellent mechanism to coordinate further work along these lines. It is therefore recommended that:

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(5) Among the testing instruments of which we are aware: the American Dental Assistants Association, Chicago, Illinois, has received a grant from the Kellogg Foundation to give proficiency examinations for dental assistants; the American Speech and Hearing Association, Washington, D.C., has developed equivalency examinations for these fields; the Professional Examination Service of N. Y. provides proficiency tests for HEW in physicial therapy, and is also proposing tests in cardio-pulmonary technology and radiologic technology; the Education Testing Service of Princeton, N.J. provides proficiency examinations for medical laboratory personnel (covering the fields of clinical chemistry, hematology, blood banking and microbiology) as well as inhalation therapy technicians; ETS is planning a test for radiologic technicians, and also provides equivalency examinations in medical technology; the N.Y. State Education Department presently offers equivalency examinations at the associate degree level in nursing.

Recommendation #10- The HPEAC should identify priority subject matter areas in which equivalency tests are needed. A thorough nationwide inventory should be made of examination instruments already in existence, and a working agenda established for the development of additional tests in cooperation with the Thomas Edison College, and appropriate professional groups, testing agencies and employer representatives.

2. Core Curricula

It has been suggested that an important basis for building accessible educational pathways to upward and lateral mobility would be a core curriculum or common group of courses to be taken by all students in related health professions. The approach is thought to harbour an important advantage in addition to its career ladder possibilities for students. Success with the approach could enable colleges mounting a variety of health professions programs, to avoid establishing wholly independent, free-standing courses of instruction in the different specialties. It could both assist in realizing economies of scale with respect to the use of faculty and physical facilities, as well as make possible more efficient management of student enrollments.

Nevertheless, the core curriculum's outstanding benefit to both health workers and society is said to lie in its promise for providing a pool of professionals whose qualifications are flexible enough to permit them to shift occupational fields with minimum retraining, in response to changing technologies and personnel needs. Properly designed, it could assist students in choosing their ultimate career specialties by familiarizing them with the diverse opportunities in the health field. If the team approach previously discussed is to be fully realized, moreover, then it will be indispensable that health professionals share a common educational preparation to a significant degree. A core curriculum would expose students to a basic language, outlook and philosophy and thereby enhance their ability to interact with the other participants in the health care team.

Identifying the potential advantages of the core curriculum, unfortunately, is easier than confronting the difficulties in constructing such educational programs. This should not be surprising since the task incorporates many of the problems associated with other interdisciplinary efforts. Not only is it necessary to first ascertain the common elements, or primitives, which are required in the various health professions, but attention must be given to the prevailing as well as desirable credentialing criteria in these fields. All of the requirements for cooperation and communication between the health professions, governmental and voluntary agencies, and educational institutions previously cited as necessary in this field, apply with no less force in these endeavors.

Finally, while many efforts have been launched to develop core curricula for the health professions, the evidence of success is extremely tentative at this time. Indeed, the implementation of the core approach is not without a variety of problems. An objection to some current plans centers around the requirement of perhaps excessive science preparation for some fields, such as health care management or occupational therapy. (6) In addition, adopting the core approach sometimes causes difficulties in the sequencing of content in clinical courses, for correlation with concomitant professional courses in the student's major.

On balance, therefore, it is evident that the promise of the core curriculum concept has yet to be sufficiently developed to justify its widespread adoption. This uncertainty is reflected in the fact that in 1971 a second contract was awarded to the Association of Schools of Allied Health Professions by NIH's Bureau of Health Manpower Education. The Association has been charged with a one-year study of the "state of the art of core curriculum in allied health education". We agree that such a study is overdue and consequently recommend that in pursuing this approach in New Jersey:

Recommendation #11 - The HPEAC should establish a curriculum sub-committee representative of collegiate institutions, provider agencies, consumers, students, and appropriate professional groups, which will clarify the various definitions of the core approach and investigate existing practices and concepts. It should identify the rationale, objectives and procedures for establishing the core curriculum concept at the two and four year college level, and issue guidelines to assist the institutions of higher education interested in adopting this approach. The HPEAC should also assist all institutions of higher education in identifying course equivalencies so that credits are transferrable on an equitable basis.

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(6) On the other hand, performance in the core sequences can be a basis for further career and education planning. For instance, the student faring badly in the basic sciences can be directed away from fields like medical technology or nursing, and towards fields such as occupational therapy, social work, or medical record administration.

3. Modularization of Learning Units

An approach which many colleges and health professions programs are adopting, both because of its intrinsic merit as well as its facilitation of the core curriculum concept, involves the preparation of modular learning units. Its major strength resides in offering an escape from the dilemna of having to proliferate the number of basic courses offered at an institution in each of the specialties, or offering courses so general that students cannot relate them to their particular career interests.

In addition, the prior preparation of such modular units can help free faculty from the continuous preparation and presentation of material which students themselves can acquire when they deem it important or essential. Faculty as a result should be able to devote more time to more students in those critical areas of the professional curriculum where there is no substitute for direct, one-to-few instruction. Students can also learn to become more responsible and independent learners. By individualizing select areas of instruction, and developing an educational management system to control student and faculty assignments which will interface with the modules and clinical training, enrollment can be increased and unnecessary duplication avoided. Such an approach to instruction should provide additional opportunities to become more effective in the establishment of career ladders, while the equivalency examinations previously discussed can be developed to permit students to by-pass certain module units and concentrate on other modules where they have known deficiencies in knowledge. It is our belief, in fact, that the future development of equivalency examinations for modular units of instruction is a far more realistic expectation than for courses in their entirety.

Switches in career preferences could be more readily accomplished when students concentrate on mastering selected modular units rather than whole courses. The modular units could vary in length, and would more readily facilitate the incorporation of new materials into the curriculum. Differences in both individual student capacity and background, as well as professional requirements, also could be accommodated more easily under this approach.

Many institutions have found, moreover, that the development of behavioral objectives greatly eases the formulation of modularized instructional units. The use of behavioral objectives, in general, has also been shown to be an effective way to organize the learning sequence and evaluate student progress as they move through the program. It is interesting to note that certain accrediting agencies (the Council on Dental Education, for example) have decided that institutions which are to be accredited in the future must set forth behavioral objectives for each course as a prerequisite to their accreditation. In view of these considerations it is recommended:

Recommendation #12 - *That the HPEAC assist in coordinating the activities of those institutions within the state which offer similar programs so that common sets of behavioral objectives and instructional modules can be mutually constructed as a first and essential step toward the development of state-wide health professions education curricula and career ladders. The HPEAC will also seek the cooperation of appropriate national accrediting bodies, to assure that such program modifications remain congruent with nation-wide credentialing standards.*

E. Career retention and mobility

Career mobility opportunities are a function both of actions on the part of employers as well as educational institutions. Individuals accepting jobs with an employer committed to offering opportunities for mobility are able not only to master their entry level positions through experience training, but to expand their knowledge and skills through short courses and in-service training, and thus gradually broaden their range of responsibilities. Successful programs require a structured sequence of promotional stages, released time for training and coursework, opportunities for counseling and evaluation, and effective placement services.

Increased prestige, authority, and salary are consequences which offer not only incentives for the employee's growth, but also serve to reduce their turnover and ultimately personnel costs. Thus the concept of career mobility is a means of filling the requirements for personnel in the skilled and semi-skilled occupations, as well as increasing the stability and commitment of the work force staffing our health delivery facilities.

From the employee's point of view another problem involves those practitioners who for one or more of the following reasons are denied proper status or certification and subsequently encounter both employer and educational barriers to the acquisition of the necessary training experiences. Four instances where this might occur are:

1) where the individual has received on the job training;

2) where the individual has received parallel but different training from that in which he is now engaged;

3) when the responsibilities of the job have increased or been modified and previous training is deemed inadequate;

4) when an individual's training goes unrecognized (e.g., when the training was in a foreign country or in the military services).

With only few exceptions individuals such as those listed above cannot easily gain entrance into the educational programs which might offer them the necessary credentials.

Even if our educational institutions develop equivalency testing procedures and flexible modularized curricula, the employers of allied health professionals likewise must actively encourage their employees to develop to their full potential. Employer responsibility in this area appears to fall into two categories:

1) They must develop meaningful institutional career ladders into which the educational program ladders can feed. This requires the elimination of low-level dead-end jobs wherever possible.

2) They must provide adequate released time for continuing education or in-service training.

This focus on the employer's involvement in continuing education should lead to the development of continuing education experiences which benefit both the employer and employee and are coordinated with similar efforts within allied health education programs. It is envisioned that continuing education programs, when formulated in the above manner, might become extension modules of health professions curricula. These modules should be accessible (through equivalency exams) to a wide variety of employees and in the same manner as other curricular offerings, become reasonably standardized and coordinated throughout the state. Such programs should also be accessible to part-time students who want to continue their education while already employed.

This emphasis on the importance and need for coordination of state-wide continuing education programs will be addressed further in the next chapter. It is sufficient to say here that the development of such programs are necessary in order to improve job retention and career mobility factors among the State's health professionals.

CHAPTER V

CONTINUING EDUCATION

Continuing education in health related fields is usually conceived of quite narrowly as encompassing only the "refresher course" approach for health professionals. We have, instead, identified five major areas of need and recommend:

Recommendation #1 - That continuing education programs in the health professions should be established in reference to the affective, behavioral and cognitive domains:

1. *For updating the competencies of health professionals;*
2. *For the education of public officials at all levels of public health;*
3. *For the reinforcement of the understanding of guidance and vocational counselors of the changing nature and opportunities for students in the health professions;*
4. *For education of the citizen to participate in community organizations addressing health problems and their solution;*
5. *For the education of individuals in personal and family health care.*

Establishing such a broad-gauged definition of continuing education, which reaches out to all our population, is made more urgent by the facts of rapid social change. Education in each of the areas mentioned above needs also be education in new approaches and new viewpoints on health care to cope with the problems associated with New Jersey's status as the most highly urbanized state in the nation. Activity in the last three of these areas, however, would best be coordinated from institutions which will be engaged in the preparation of Health Educators and Information Specialists, an occupational category to be discussed later in this plan.

A. Updating the Competencies of Health Professionals

Responsibility for the conduct of continuing professional education activities long rested solely with the professions themselves. Although for many years this approach was reasonably successful, more recently some criticisms have been raised and a degree of accountability for their efforts have been demanded by federal agencies, third party insurers, and to some extent by the professions themselves. Emerging from these discussions is the realization that in addition to the professional groups, educational institutions, state agencies and the licensing boards should share responsibility for this aspect of continuing education.

Moreover, throughout the nation, licensing boards are beginning to examine the propriety of requiring that some formal process of continuing education be instituted as a means of insuring continuing professional competency in both health and education(1). Whether or not participation in continuing education becomes a mandatory aspect of re-licensure and recertification procedures, as some would suggest, there is little question that additional mechanisms must be developed to prevent professional obsolescence, and to assist providers to health care in increasing their proficiency and capability for accepting further responsibility.

One such mechanism is self-assessment by the providers of health care. Such self-assessment programs place the primary responsibility for continuing education on the health practitioners themselves, rather than on external professional groups, educational institutions, state agencies or licensing boards.

Self-assessment programs could be developed by responsible agencies and might consist of self-administered tests followed-up with confidential reports to allow the health practitioner to 1) determine the level of his knowledge, 2) compare his information to that of other practitioners and 3) help plan his continuing education according to the results of the tests. The examinations should be directed towards maintaining and improving clinical competence.

The reports from the testing agency returned to the health professional might include his total score, his responses, the correct answers and a reference to a learning resource for further information. The tests and reports would, therefore, indicate the state of his knowledge and help him to pin-point areas for further study.

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(1) Here in New Jersey, Senate Bill S-640, supplementing Chapter 14 of Title 45 of the statutes describing professions and occupations, was passed in 1972. It establishes a six-member commission which is currently developing criteria for continuing education for New Jersey pharmacists. Beginning in 1973 for re-licensure in 1974, satisfactory proof must be furnished to the Board of Pharmacy that a minimum amount of continuing education courses and credits have been pursued in the previous year by licensure applicants in order to qualify for re-licensure.

Participants should be encouraged to take the tests at their convenience and without time constraints. The scores of the tests could be determined by computer and reported directly to the participant. Since the results of the tests would be confidential, most practitioners should be motivated and willing to take them.

This form of self-assessment program would provide the health professional with a specific blueprint for his continuing education.

In this respect, the continuing education of health professionals also might be viewed as a program of evaluation and examination that ultimately assesses the quality of health service and patient care. The general statistical results of this sort of inquiry should then be fed back into the education programs of our institutions, assisting in their restructuring, and the identification of fresh priorities and emphases.

In the field of continuing education for doctors and dentists, long standing exploratory efforts culminated this past March in the formal establishment by the CMDNJ of an Office of Continuing Education. Operating initially with State support, it is anticipated that the Office will be sustained through cooperative funding in the future from the New Jersey Medical and Dental Societies, Hospital Association, and other appropriate and interested groups. All of these involved organizations have endorsed and approved the project, which ultimately will serve the entire State and reach into the community hospitals in a cooperative venture. This initiative is strongly endorsed by this plan and the progress of this partnership will be evaluated in future revisions to determine its relevancy to analogous efforts in other health fields.

Turning to the general responsibilities of the State's colleges for the continuing education of health professionals, it is believed that logically they should reside at that institution or those institutions which are best qualified because of staff, organization or previous experience in offering related programs. Where more than one institution offers the professional degree, responsibility for coordination should be shared in such manner that the resources of each are fully utilized without duplication of effort. The cost of this education should, on the whole, be assumed by the professionals themselves. However, financial assistance should be given to lower paid professionals.

In allocating responsibility for continuing education for the health professions, the professional associations should be included in overall planning and implementation. They, and the higher education community jointly can best determine the scope and the locus of quality programming. In addition, some areas of education have relevance for other disciplines. Interdisciplinary planning, therefore, would provide a broader and more comprehensive continuing education program.

B. Education of Public Officials

With the anticipated development of undergraduate and graduate programs in public and health administration, the continuing education for government officials with health related responsibilities might be lodged in those institutions which will embark on the new degree programs. A natural base for this responsibility can be found in the State University's Extension Division and Cooperative Extension Service. However, the CMDNJ should be called upon for its expertise in health care matters which would be part of the continuing education of public officials. Engineering colleges in the State also could work with those public officials as their discipline applies to public health; should any of the state colleges develop programs in public and health administration, they too might have a role to play. Above all, what is required are creative arrangements whereby the institutions of higher education join their several resources in evolving an integrated statewide program, rather than attempting partial, fragmented efforts.

C. Education of Guidance Counselors and Vocational Counselors

With technologies expanding and shifting in the health field, along with changing curricular offerings and the launching of new programs, the role of the school guidance counselors and others in the field of career guidance is critical. Time, money and commitment can be lost if students are not advised appropriately. Continuing education programs for guidance counselors should be stressed, so that health manpower needs, innovations and changes can be directly transmitted to those considering entering health careers.

D. Citizen Participation in Community Health Organizations

Current developments in the health field such as citizen participation in comprehensive health planning, the emergence of health maintenance organizations as a focal point for the delivery of health services, and the increasing role for the health consumer in the determination of health care policy, indicate the need for the education of the citizen-consumer of health services. Moreover, current attempts to solve urban problems, health related and otherwise, have produced a wide variety of citizen participatory agencies, and voluntary community health organizations, some the product of individual effort and many the product of federal and state legislation. These citizen group and voluntary organization participants require education in the area in which they have become involved. The education of these groups should lie with Rutgers University and the CMDNJ in centers throughout the State. The former has experience in health consumer education, while the latter is developing departments of community medicine and dentistry which have special competence in the extension of concepts of community organization for new forms of medical care such as neighborhood health centers. As other colleges develop appropriate extension mechanisms, they too could serve community groups in this capacity.

E. Continuing Education in Individual and Family Health Care

Education in individual and family health care, at present, is not continued through formal education beyond the secondary school with the exception of the family life education programs, and the nutrition programs of the Cooperative Extension Service at the State University. Developments in health care education evidenced by programs supported by the U. S. Department of Health, Education, and Welfare, indicate a growing concern with the individual's lack of knowledge about personal and family health care. The concern is greatest with regard to the heavily populated urban areas of the state which already suffer from inadequate formal health services. Our schools and colleges should be encouraged to incorporate material on health matters as an integral part of their curricula.

This kind of continuing education should be directed to the individual or to the family and might well be expanded with assistance from the CMDNJ and the University Extension Division at the State University. This latter structure embraces at present personnel in each county involved in nutrition education, family life education, and youth development. Augmentation of this structure to include the field of individual health care can be efficient and effective almost immediately. Immediate attention should be given to melding the expertise of the faculty of the CMDNJ with the communications and extension network of the Rutgers Cooperative Extension Service, to maximize their experience and resources in this effort.

Meanwhile community colleges and state colleges are developing geographic areas of interest and concentration. For example, Glassboro State College has a strong interest in and accepts responsibility for much education in southern New Jersey. As the state colleges change in orientation and the community colleges grow in their capacity for continuing education, this responsibility can be shared by their working in close cooperation and in augmentation of the programs of the University and the CMDNJ.

The use of mass media particularly for "the education of the citizen in community health organization" and "continuing education in individual and family health care" should be a part of the considerations to effectuate this objective. The State of New Jersey has over sixty AM-FM educational and commercial stations operating within its confines. Efforts should be made by the various cooperating institutions, in producing health information programs, to gain the support of these radio stations. In addition, the Public Broadcasting Authority of New Jersey has a responsibility not unlike the education institutions to provide services to the public. Through their television services both on the open and closed circuit, client groups for all the health service organizations can be reached.

Training programs for personnel who will use the media can be arranged so that professional standards of broadcasting can be maintained for this sophisticated method of transmitting information. There are several colleges within the State which operate open circuit stations and have concomitant training programs for their students. The State University with its television and radio services also is a source of transmission to various media in the State.

Above all, sound consumer health education calls for the implementation of quality educational programs in the early grade school years with a continued effort being made through the conduct by hospitals and other health care service agencies of public programs in preventive medicine. The need to develop personnel and stimulate the expansion of societal activity and job opportunities in this functional area is further discussed below in the section in Chapter X dealing with Health Educators and Information Specialists.

F. Conclusion

Care and evaluation will be needed to insure that continuing education programs result in real learning achievements, based on explicit learning objectives, and that they do not degenerate into mere time serving experiences. Criteria other than sheer attendance must be developed that will objectively demonstrate if desired behavioral change, and/or knowledge increments, have been achieved. Moreover, continuing education activities must be based upon the joint participation of educational institutions (to assure quality) and professional associations, provider agencies and consumer groups (to assure relevancy), in their initial elaboration and evolution.

In addition, the advantages of computer assisted instruction, modular learning units, and other technological and audio-visual advances should be explored because of their special relevance to the field of continuing education activity and the opportunities they offer for around-the-clock, individually paced, self-instructional learning experiences. Methods also should be developed to broadly disseminate "calendars" of course offerings, providing information on the level of materials offered, their hours, location and sponsoring institution. Likewise, computerization of these course offerings, including qualitative indices of institutional and individual performance, should be explored. Finally, the concept of an interdisciplinary approach to continuing education programming must be internalized by all institutions engaged in this activity. Joint planning and presentation involving physicians, pharmacists, nurses and auxiliary fields (with analogous participation in the area of dental health personnel), should be emphasized to promote learning and future functioning as members of health care teams.

The broad discussion of continuing education presented in this chapter is designed to encourage those educational institutions which are involved in the various forms of health education to recognize their responsibility to not only their graduates and professional colleagues, but also to the citizenry of the State. This latter responsibility can be realized by developing institutional and program commitments to the surrounding community through the variety of means described in the preceding discussion. If good health is a right of the public then our colleges and universities should be involved in educating that public wherever appropriate and in keeping with each institution's particular capabilities.

CHAPTER VI

REGIONALIZATION AND INSTITUTIONAL COOPERATION

REGIONALIZATION

It could be suggested that a completely centralized system of health manpower training is called for because it would provide high quality preparation at minimum costs. If such were the case, the creation of a single school of health professions education, given extensive available clinical facilities, might be the appropriate approach. There are compelling arguments, however, favoring a regionalized approach to the establishment of several centers, or health professions program consortia within our State. The most cogent of these are the following:

1. Student Opportunity: Every citizen of New Jersey should have "the opportunity to be educated to the height of his potential" and not find it "foreclosed because the individual lacks... financial resources."(1) This philosophy is at the heart of the New Jersey system of higher education. As it applies to the health professions, it means that programs must be available within commuting distance both for those who lack the means to live away from home and for those currently active in a health profession and seeking to upgrade their skills while employed.

2. Inactive Personnel: The corollary of student opportunity is the need to utilize the talent pool represented by temporarily inactive personnel. In some HMOC's (e.g., nursing) there are many experienced professionals interested in returning to work in the health care field after a period of five to twenty years devoted to family concerns. Both refresher courses and programs to upgrade skills should be available to such persons near their home communities. Regionalization is also relevant to needs for continuing education programs as discussed in Chapter V.

3. Circumscribed Resources: No single location exists in the State with the rich and varied clinical resources necessary to support the many health professions education programs required.

4. Existing Physical Resources: Educational and clinical facilities now in existence should be put to the most effective use practicable. In many cases, this use is in the development of health care personnel. Excessive centralization of allied health programs would result in the non or under-utilization of excellent educational and clinical facilities for personnel training purposes.

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(1) Goals for Higher Education in New Jersey, Phase I, Master Plan, 1970, p. 10.

5. Existing Human Resources: The contributions of qualified individuals on the faculties of many of our higher education institutions would be similarly lost under an excessively centralized approach.

6. Operational Economy and Efficiency: The previous points, in addition to their general validity, cite the reasons for not overly centralizing allied health programming in one super-institution. There is important justification for regionalization of allied health programs, moreover, which argues that it also represents a necessary alternative to their complete dispersion in any and every college in the State. The reasons for this relate to the economies of scale in the use of human and physical resources which can be achieved, as well as the mutual reinforcement which faculty in related program areas can provide one another. A regionalized approach to identifying manpower and program needs is therefore justified as a procedure for resolving the conflict between the desire for maximum program accessibility and the need for minimizing costs. In addition, it provides a useful administrative convenience, and in those HMOCs where the number of personnel and institutions involved is high, would facilitate the planning process through local involvement in decision making.

7. Interface: As outlined below, the clustering of related allied health professional education programs can serve both to add resources to health care education and as a stimulus to the comprehensive utilization of personnel.

For the above reasons, the following recommendation is made:

Recommendation #1 - The State of New Jersey should be divided into four major regions for the purposes of planning in the health professions education field. These regions conform with the N.J. Comprehensive Health Planning Areas of the Department of Health's Comprehensive Health Planning Agency. The counties they incorporate are:

Area One - Bergen, Hudson, Passaic, Sussex
Area Two - Essex, Morris, Union, Warren
Area Three - Hunterdon, Mercer, Middlesex, Monmouth, Ocean and Somerset
Area Four - Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem

On the following page is a map depicting this breakdown. Justification for this distribution is as follows:

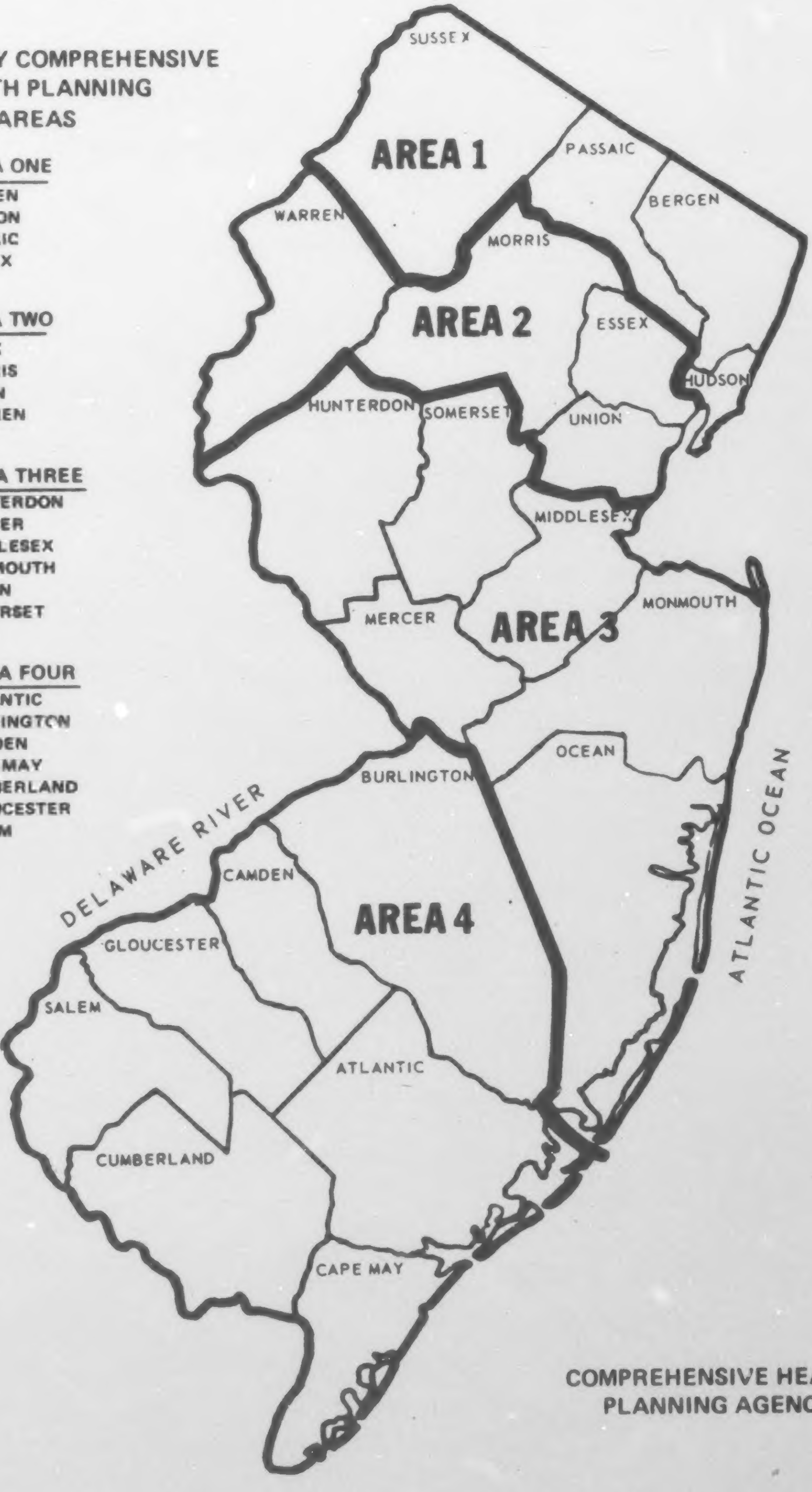
NEW JERSEY COMPREHENSIVE HEALTH PLANNING AREAS

AREA ONE
- BERGEN
- HUDSON
- PASSAIC
- SUSSEX

AREA TWO
- ESSEX
- MORRIS
- UNION
- WARREN

AREA THREE
- HUNTERDON
- MERCER
- MIDDLESEX
- MONMOUTH
- OCEAN
- SOMERSET

AREA FOUR
- ATLANTIC
- BURLINGTON
- CAMDEN
- CAPE MAY
- CUMBERLAND
- GLOUCESTER
- SALEM


SUSSEX
AREA 1
PASSAIC
BERGEN
WARREN
MORRIS
AREA 2
ESSEX
HUDSON
HUNTERDON
SOMERSET
UNION
MIDDLESEX
MONMOUTH
MERCER
AREA 3
OCEAN
BURLINGTON
DELAWARE RIVER
ATLANTIC OCEAN
CAMDEN
AREA 4
GLOUCESTER
SALEM
ATLANTIC
CUMBERLAND
CAPE MAY

COMPREHENSIVE HEALTH PLANNING AGENCY

1. The regions are of sufficient size and concentration, and incorporate appropriate requisite educational and clinical facilities, to permit the development of one or more health professions education consortia consistent with the needs of their population.

2. The 1970 population in each of the regions is roughly similar running from 2 million + in Area 1 to almost 1.4 million in Area 4. Table I depicts the population figures, by county, for each of the areas as well as the projections utilized in the HMDP.

3. The regions are sufficiently extensive to permit the planning of programs without unnecessary and costly duplication, and to achieve economies of scale. These criteria would be less achievable if too many, smaller planning regions were established.

4. The regions are deliberately developed along county boundary lines, in order to facilitate the effective operation of the community college chargeback mechanism for financing students attending institutions outside their county of residence.(2)

5. The congruence of the Comprehensive Health Planning Areas with the proposed higher educational program planning regions will facilitate the exchange of information regarding local health care needs and personnel requirements between consumer, provider and educational groups.

6. Because the regions conform with the State's Comprehensive Health Planning Areas, which were developed under federal guidelines, and hence are recognized by national authorities for health facilities and delivery planning purposes, it is believed that the receipt of financial support for educational program planning and impementation needs will be facilitated.

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(2) Conversely, where a program at a public community college is designated to meet regional manpower requirements in an occupational category, it will be necessary that all applicants from any county in the region be treated equally for enrollment purposes, with no priority given to students from the county where the college is located.

NEW JERSEY
POPULATION PROJECTIONS (3)

TABLE I

	1970 Census	1975 Est.	1980 Est.
Area One			
Bergen	898,012	980,531	1,059,318
Hudson	609,266	612,797	615,100
Passaic	460,782	489,304	516,668
Sussex	77,528	82,302	86,630
TOTALS	2,045,588	2,164,934	2,177,716
Area Two			
Essex	929,986	951,216	971,067
Morris	383,454	416,729	448,313
Union	543,116	585,614	627,161
Warren	73,879	76,426	78,828
TOTALS	1,930,435	2,029,985	2,125,369
Area Three			
Hunterdon	69,718	74,004	78,009
Mercer	303,968	319,720	334,455
Middlesex	583,813	631,769	677,759
Monmouth	459,379	502,506	541,352
Ocean	208,470	234,875	258,991
Somerset	198,372	215,400	231,771
TOTALS	1,823,720	1,978,274	2,122,337
Area Four			
Atlantic	175,043	182,333	188,896
Burlington	323,132	357,014	389,399
Camden	456,291	488,578	519,477
Cape May	59,554	63,438	67,092
Cumberland	121,374	128,923	136,036
Gloucester	172,681	187,638	201,992
Salem	60,346	63,603	66,706
TOTALS	1,368,421	1,471,527	1,569,598

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(3) Figures derived from Table I, p. 269, "Health Manpower in New Jersey: Report of the Health Manpower Data Project", N.J. State Department of Health, December, 1971.

Recommendation #2 - *The Department should support the formation of Health Manpower Committees in each of the N.J. Comprehensive Health Planning "B" Agencies. Coordination of these committees should be effected through the N. J. Comprehensive Health Planning Agency ("A" Agency). Membership on these area health manpower committees should include appropriate representation from educational and employer (clinical) institutions in each of the designated regional ares, as well as from the health professions and consumer groups.*

Recommendation #3 - *HPEAC and Departmental consideration regarding the formation of health professions education consortia, or the need to establish new health professions education programs, or significant enrollment expansions in existent programs, should include review of commentary from the "B" Agency Health Manpower Subcommittees regarding regional manpower needs, ease of access and other pertinent considerations.*

The functions of the "B" Agency Manpower Committees, should include but not be limited to:

a. Identification of local manpower needs and surpluses (based on desires & access) in specific health occupations.

b. Identification of available clinical facilities and encouragement of the best utilization of clinical facilities by educational institutions.

c. Identification of local needs for delivery of types of services by health professionals -- the term "services" to be interpreted as (health care) function, so that the use of specific occupational categories is avoided.

d. Identification of local needs for in-service and related continuing education or training programs for short courses and other extensive activities (see Rec. #7).

e. Support of the concept of appropriate utilization (and evaluation of functioning) of health personnel.

f. Identification of and participation in programs of health information and education.

g. Encouragement of formal and informal cooperative institutional arrangements.

It is important to preserve the prerogative of educational institution faculty to construct their programs in light of their experience in the academic setting, and their goals for well-balanced curricula supportive of both general education principles as well as specialized occupational skills required by the students. The "B" Agency manpower committees are not expected to pass judgment on the quality and content of proposed or existent educational programs, but rather to verify manpower needs and proper utilization of clinical facilities.

There is also need for structured input and mutual respect among educational, employer, consumer and professional groups to help insure that curricula in the health professions are responsive to the changing needs for health care in our society.

It should be noted that it is not intended to fund programs through the "B" agencies, but directly to educational institutions. By law, this funding responsibility rests with the Board and Department of Higher Education.

It is therefore further recommended that:

Recommendation #4 - When it has been determined that a need for additional manpower production in a particular health occupational category is warranted, the HPEAC should define minimal requirements to meet objectives and indicate that program proposals from collegiate institutions would be welcomed for evaluation.

Recommendation#5 - The "B" Agency Health Manpower Committees should work with local educational institutions in defining the need for in-service and related continuing education programs, for short courses and other extension activities, and for other ways in which these institutions can best respond to the health service delivery manpower needs of the region.

INSTITUTIONAL COOPERATION

1) Sharing of Resources

An important problem in an era of mounting public concern over the rising costs of higher education is that of underutilization of resources. This issue is of particular cogency with respect to the use of expensive, specialized laboratory facilities.

Fortunately, there would appear to exist in the health professions education programs a number of opportunities for institutional shared use of these and other resources and, perhaps surprisingly, one which may work with the greatest frequency between colleges at different levels in the educational spectrum. An illustration may be found in the medical technology field where personnel at the laboratory technician level are normally prepared for associate degrees in community colleges, while the technologists receive their preparation in four year baccalaureate degree awarding institutions.

It would appear that in this sequentially related specialty area, analogous to situations in the dental, radiological and therapeutic auxiliary fields, the supporting laboratory facilities required for both are extremely similar or readily adaptable. If this is the case, then responsible use of public funds would mandate that the laboratory-based courses in such a closely related two-year/four-year curricular sequence be provided at that institution with the strongest, or earliest built facilities, especially when geographic separation is not significant.

A practical example of such a procedure is currently being explored by Middlesex County College and Livingston College. The former institution, which possesses excellently equipped laboratories in several health professions fields, under this approach, would accept Livingston baccalaureate candidates who, in addition to seeking the broad-gauged liberal arts preparation implied in that degree, likewise wish to develop an occupationally oriented component in their collegiate training. At a logical point in the course of their study, and with the approval of the faculty at each institution, Livingston students would undertake additional course work at Middlesex. Depending on the juncture at which the student begins study at Middlesex, the Livingston students would be awarded baccalaureate degrees either at the completion of the laboratory type courses at the community college, or return to Livingston for some period.

Current thinking at the two institutions indicates the need for great flexibility to make a success of this significant departure from the usual progression in higher education. The approach offers promise, however, of enabling Livingston students to pursue several health professions curricula not otherwise available to them, without the need to construct laboratories already available at Middlesex. Simultaneously, it affords opportunity to make maximum use of these recently completed facilities.

Similar possibilities for the exercise of such curricular options abound throughout the State. In addition to the advantage offered regarding savings in the construction of laboratories, and maximization of the use of those already existing, additional advantages indicate the approach merits full support:

1. It should be vigorously explored because, in light of common concerns today, the approach can relatively rapidly provide career oriented options for four year college graduates.

2. It would facilitate the development of the team care concept in the educational process by expanding the opportunities for simultaneous education of future health workers at the two, four, graduate and professional school levels. It is not

implausible to consider the contribution which this approach would make to the expansion of the clinical level training capacity of our dental schools, for example, by rotating future dentists through the clinics of our dental hygiene programs (as well as vice-versa).

3. It can provide a greater diversity of choice to students in the educational experiences, contacts and programs being available at more than one institution.

4. It would reduce to some extent the need to hire duplicative faculty in some specialized course areas common to curricula at different educational levels, and could result in a higher quality program than would be the case if discrete institutional faculty hiring practices are followed.

5. It would facilitate the exchange of ideas and perspectives among faculties at different institutional levels.

6. It can be operative not only within the regular academic day and calendar, but also evenings, weekends, part-time, and during summer and vacation periods, and thereby facilitate efforts to maximize the efficient use of facilities at the host institution.

To be sure, acceptance of these approaches will occur only when the colleges and students involved are assured of real and mutual benefits. Such student exchanges will not occur until the essential administrative and contractual questions have been answered to the satisfaction of both the faculties and administrations. Considering the possible advantages foreseen, we nonetheless recommend:

Recommendation #6 - As part of the planning process for new health professions programs, New Jersey colleges and universities should inventory the course, laboratory and faculty requirements to determine whether nearby institutions at other levels could be relied upon to provide such resources to their students.

The four year colleges, particularly, should explore whether such an approach would not enable them to expand the number and variety of health career program opportunities available to their students. Substantiated requests for financial assistance from cooperating colleges embarking on such curricular approaches, to make the relatively modest improvements in laboratory facilities requisite to enabling them to serve broader program purposes, should be given special consideration by the Department outside the regular budgetary process. Moreover, the question of equipment purchases should be reviewed not only with other educational institutions, but with clinical facilities as well. In many cases clinical facilities will possess equipment which can be utilized by educational institutions, thus minimizing costs to them.

2) Institutional Consortia

There exist within each of the four designated regions institutional configurations which through proper planning and the concentration of capital investments, could incorporate such strong educational and clinical facilities as to justify still further investment and maximization of existing didactic and practicum resources. A variety of approaches for forming institutional consortia are conceivable, and should be encouraged.

The development of such groups of mutually reinforcing clinical and educational institutions to function as health professions education consortia within a region will depend upon geographic, demographic, and historical criteria. The main geographic factors are public accessibility, inter-institutional proximity to vertically and horizontally related programs, and the availability of clinical facilities. For some programs, proximity to a specialized treatment institution or high-incidence patient population should be an important if not a decisive consideration. For example, a program in geriatrics or nursing home administration should be located in an area with a large elderly population. In a state as geographically compact as New Jersey, nevertheless, there should be little difficulty in regionally dispersing health professions education consortia in such a manner that nearly every citizen in the state is within an hour's commuting time of at least one.

In designating institutions as partners in such consortia, attention should be given both to the quality of available clinical facilities and to the nature of administrative relationships necessary to maximize the effective utilization of such facilities in the educational process. Special attention in regional health professions education consortium planning must be given to the avoidance of unnecessary duplication of effort. If there are two or more proposed programs within convenient commuting distance of one another, justifications will be needed for their separate existence, to avoid competition for scarce resources. Cooperation between public and private institutions on a voluntary basis can only be encouraged, of course, but increasing precedent exists in New Jersey for such joint efforts.

Due to the large population encompassed in some of the designated planning regions, it is anticipated that more than one consortium may emerge in these areas. In these instances, the establishment of more than one consortium of institutions in a single region will demand close coordination of their plans and activities. Wherever valid justifications can be presented, inter-regional cooperation between educational and clinical institutions should also be encouraged.(4) Nor should the availability of resources in bordering states be overlooked. Neither should every planning area attempt to establish the same programs in an effort to duplicate patterns. Finally, nothing stated herein is meant to imply inflexibility or limitations on institutional expansion if such growth is supported by an evident need for additional manpower.

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(4) Approved separate campuses of a single institution, located in different areas of the State, would be expected to comply with the planning in those areas. Such multi-campused colleges, of course, would be expected to adhere to internal institutional resource planning procedures.

The designation of health professions education consortia can strongly influence institutional development plans. Moreover, employing agencies, particularly hospitals, must be involved in the decisions regarding which educational institutions will affiliate with which hospitals. For these reasons no recommendations are being made at this time regarding the precise institutional composition of particular groupings, since the configuration of academic and clinical institutional strengths to meet the health care needs of our State will be best analyzed at the local level in the first instance. Once such groupings are formed, moreover, we do not thereby envisage that no other collegiate institutions should be involved in offering health professions programs. In addition, other collegiate institutions with existent health professions education programs should generally feel assured that, in the absence of very strong, overriding reasons related to substantive program deficiences, they will be encouraged to continue their curricular activities.(5) Nevertheless, if the benefits of regionalization and concentration of resources are to be realized, the early identification of health professions education consortia is clearly required.

It is therefore recommended that:

Recommendation #7 - A fundamental responsibility of the HPEAC will be to identify the institutional components of the health professions education consortia needed and those best capable of meeting the collegiate level health manpower requirements of their respective regions.

In the process of designating these varying kinds of consortia, the following suggested considerations are indicated, including:

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(5) The problem proceeding from the dangers of uncoordinated growth of free-standing hospital related educational programs is likewise significant. Due to the legal, policy and fiscal issues related to any resolution of this question, no recommendations are offered at this time. The Department is fully aware of the existence of this problem, however, and is engaged in exploring possible solutions.

a - Identification, "assignment", and development of proper relationships with nearby hospitals and other clinical facilities capable of supporting health professions education programs, and

b - Development of explicit short and ultimately long range plans for the separate and joint activities of the institutions composing health professions education consortia. Where more than one such institutional grouping exists within a region, plans for their coordinated efforts should be developed.

CLUSTERING OF CURRICULA

Recommendation #8 - As an integral aspect of the regionalization and health professions education consortium concepts, instructional programs should be aggregated within institutions in logical groupings or "clusters" of allied health professions programs. The academic clusters should possess significantly similar concerns in the health delivery process, and consequently a large degree of overlap in their preparatory curricula.

A cluster of related programs offered at a single institution or several cooperating institutions will mutually benefit from the existence of human and physical resources, and course offerings, not unique to a particular health care field. Moreover, further attention can be directed towards the efficient use of facilities and programs available at some institutions which are not primarily intended for health care students. These resources could supplement health care curricula requirements, substitute for laboratories which would otherwise have to be newly constructed, or make unnecessary the recruitment of some faculty were a given health care program to be offered in an institution lacking such facilities or programs.

It is useful to outline some specific ways in which clusters permit savings and advance program quality, although the range of possible benefits is much broader. The following list merely evokes the more obvious, and frequently found examples; in fact, these five advantages are so compelling that unless most if not all are present in a given instance, question could be raised whether a program under consideration should in fact be approved. These five advantages are so prominent in several groups of related fields --- Occupational, Physical, Recreational and Speech Therapy and Audiology to name a typical cluster; Cytotechnology, Blood Bank Technology, and Medical Technology constitutes another; and Dental Laboratory Technology, Dental Assisting and Dental Hygiene a third --- that given the absence of other overriding considerations, they should probably always be offered in conjunction with each other.

1. Specific courses required or recommended in more than one program can enroll students pursuing several career fields. For example, "Introduction to Laboratory Technique" and the focus of basic chemistry and biology courses would be common to students in the fields of Cytotechnology, Blood Bank Technology, and Medical Technology.

2. A single facility, such as a specialized laboratory, can serve the needs of two or more programs, but might be grossly under-utilized by a single program.

3. Faculty members qualified to teach courses in more than one specialty, can be so utilized. Instead of separate persons presenting what is essentially the same subject in a variety of programs, with the necessity for duplicative course preparations, etc., a course like "dental materials" which is required in dental hygiene, dental lab technology, and dental assisting, might be handled by a single individual presenting a core course to all students with additional modules as necessary for each specialty.

4. Bibliographies and reference needs in many health care areas overlap, and a cluster thus permits savings in the acquisition of increasingly expensive book, periodical, and especially non-print materials.

5. The elaboration of curriculum cores and the construction of modular learning units, previously discussed, which are common to several programs, is more feasible when related specializations are clustered in a single institution.

In addition to effecting savings and improving program quality, a well-designed cluster of health professions curricula will serve to reinforce the student's experience in at least two other ways, both discussed in previous chapters. In clustered programs at the same approximate educational and operational level, students will develop increased understanding of the specialized tasks of their peers, an advantage of increasing importance in light of this plan's advocacy of health care team concepts. Students also will be able to evaluate related programs, learn which of their developing skills are transferrable, and in general acquire greater mobility for employment in the health care professions.

INSTITUTIONAL ROLES

The broad roles of public and private colleges and universities has been extensively discussed in Phase II of the New Jersey Master Plan for Higher Education and needs no further elaboration here. Within the context of the HPEMP, however, it must be recognized that the various categories of public and private institutions incorporate a richness of resources and experience in health professions education and research activities. Many, if not most, of the separate institutions are already engaged in such endeavors to some extent (Appendix F). It is anticipated that the number, diversity and enrollments of health professions education programs will increase, and that all types of public and private institutions will participate in that growth.

This would mean, for instance, that while by legislative mandate the College of Medicine and Dentistry of New Jersey is the sole institution responsible for the public education of physicians and dentists, private institutions are not precluded from engaging in such activity. Indeed, the continuing role and contribution of the Fairleigh Dickinson University Dental School are recognized in the discussion which follows in Chapter X.

During the discussions which have contributed to the development of the HPEMP, moreover, special attention was focused on the CMDNJ's involvement in the other fields of health professions education. The arrangements and understandings required to both benefit from its resources, without either detracting from the authorities of other institutions or failing to make full use of their capabilities, was the subject of considerable dialogue. The remainder of this section therefore addresses this unique institution's role at greater length. (It bears mention, once again, that in the dental personnel fields, the Fairleigh Dickinson School of Dentistry has an analogous role to play.)

The College of Medicine and Dentistry of New Jersey: Today, and increasingly in the future, the CMDNJ incorporates a wealth of human and physical resources in the health area. Its future development presents an extraordinary opportunity to the State in the field of health professions education. The Department of Higher Education and our collegiate institutions should look to the CMDNJ not only for their appropriate direct participation in offering medical and dental education and selected allied health education programs, but to it also for guidance, leadership and assistance in the State's efforts in this field generally.

The CMDNJ's experience and future responsibilities for the burgeoning problems of health care delivery, can be of immense assistance in the broad field of allied health programming. The content of many of the programs must reflect job definitions in the health care delivery agencies. Physicians and dentists play a key role in helping define many of these occupations. An important means of tapping the CMDNJ's knowledge of these matters will be through the establishment of the statewide Health Professions Education Advisory Council, in whose deliberations it can be expected to play a significant leadership role.

In addition, the CMDNJ can play a significant role in the formation and activities of several of the health professions education consortia to be developed in the State. The Carnegie Commission on Higher Educations's Special Report on "Higher Education and the Nation's Health", identified medical schools and university science centers as the focal points around which the organization of such centers should proceed. As previously noted, we do not believe this is the sole manner in which such consortia should be formed, but neither should be it be disregarded.

An important ancillary aspect of the CMDNJ's activity, both in direct collaboration with other colleges through the recently formed joint CMDNJ'Rutgers University Committee for Health Services, as well as the Council on Higher Education in Newark, and through the HPEAC, will be to help link the experience of instruction to the realities of health care delivery.

As discussed earlier, a fundamental assumption regarding this linkage principle is that it incorporates the team concept of the delivery of health care and the education of health professionals. Under this approach, practitioners would be encouraged to work together through an interdisciplinary educational process. Among the benefits foreseen is the avoidance of fragmentation and duplication of effort, and the consequent reduction of existent shortages in health manpower. The CMDNJ through its participation in the HPEAC can thus function as an authoritative resource agency to the Department and institutions of higher education, by working with them to help stabilize and avoid the potential sharpness of wasteful competition, untrammelled expansion, and programming poorly related to emerging health delivery concepts, in both the academic and clinical settings.

In addition, the CMDNJ should play an appropriate role by itself offering programs in the allied health field. Its responsibilities in this regard are again a function of its rich assets. Indeed, its present academic and clinical facilities are in three different geographical locations --New Brunswick-Piscataway, Newark, and Jersey City -- and will be supplemented with new teaching hospitals in Newark and Piscataway, which would facilitate the CMDNJ's participation in a statewide system for allied health education. Explorations are underway, moreover, for the location of another campus of the CMDNJ in the Southern part of the State.

Any overview of the CMDNJ's resources show it highly capable of supporting educational programs in the allied health professions. This reality underlines the possibilities, challenge and necessity for properly interrelating its work in this field to the parallel responsibilities of other institutions of higher education in the State. It would, indeed, be grossly inefficient to not tap these extensive assets for health professions education purposes, going beyond the CMDNJ's primary responsibility for the initial preparation of physicians and dentists. (Nothing is intended by the previous statements, of course, to imply that other clinical facilities in the State, unrelated to the CMDNJ, are not capable of supporting their own in-service or broader educational programs in coordination with other higher education institutions.)

This master plan is, therefore, made coherent in philosophy and tenable in application through the basic assumption that the CMDNJ will best discharge its allied health responsibilities by following the guidelines contained in the following two recommendations:

Recommendation #9 -

In-house programs - The CMDNJ should itself offer certain carefully identified programs in the allied health professions. In general, the College should contract for the remedial, general and pre-clinical course aspects of these programs with nearby public and private higher education institutions, rather than hiring its own staff for these purposes.

The justification for the CMDNJ's offering its own programs will be found in some combination of the following factors: the unique configuration of resources which the CMDNJ may incorporate (e.g., in the field of nuclear medicine); in the mutual importance to the preparation of doctors and dentists and certain other health personnel that they be trained in a common educational environment; in the responsibility for in-service education which the CMDNJ bears for the employees of its own hospitals; and in some instances where personnel for certain health manpower categories are not being educated at all, or sufficiently, elsewhere.

Being a multi-campus institution, the CMDNJ will need an educational and administrative structure to supervise such activities as are outlined above. It is envisaged that it will establish a College-wide School of Allied Health Professions. This School would be analogous to the similarly designated school and departments which other higher education institutions have established to coordinate their activities in this field.

Recommendation #10 -

Affiliated Programs and Responsibilities - On the basis of voluntary agreements, the CMDNJ's hospitals should be considered by other educational institutions for the provision of the clinical components of their programs. In these joint efforts, of course, the CMDNJ should have substantial input into the curriculum design of such programs.

This in no way implies that all or even most allied health programs should enter into joint effort with the CMDNJ; rather, that voluntary, cooperative arrangements should be encouraged wherever mutually advantageous and beneficial to students and to the quality of these educational programs. This latter approach would likely comprise the major proportion of the CMDNJ's allied health education activity. The faculties of both institutions should share in the responsibility for elaborating the curriculum, and insuring that an organic relationship exists between the didactic, preclinical and clinical work.

The latter approach is believed to offer several advantages:

1. It provides for full CMDNJ participation through joint sponsorship in program development and implementation, wherever relevant in the full scope of the professional program. It also leaves to the other, usually undergraduate, institutions appropriate responsibility for academic courses normally within their purview.

2. It builds to the normal strengths and experiences of the various institutions, and will not require the hiring or contracting of personnel not typically found on their faculty rosters (thus avoiding unnecessary faculty duplication, while permitting economies of scale in enrollment management).

3. It recognizes that many of the components of an allied health curriculum, including the general education and pre-clinical science courses, can be conducted less expensively by two-year and four-year colleges, as compared to the high cost faculty salary environment of medical and dental schools.

4. It would maintain the institutional role assignments of the various public and private institutions, as established by Phase II of the Higher Education Master Plan. Simultaneously it would afford the CMDNJ a strong role in maximizing the quality and relevancy of allied health education programs to emerging trends in medical and dental care delivery.

5. It will enable the CMDNJ to act as a catalyst and to contribute effectively to the building of curricula models for similar programs, irrespective of their base of education and operation.

It must be noted, finally, that the activities of the CMDNJ in the field of allied health programming should, wherever appropriate, be based on the team concepts discussed earlier. The contributions, knowledge and sensitivities of each health professions and faculty must be recognized by all educators, or the construction and operation of allied health programs will not be animated by the models for teamwork called for in Chapter II.

CHAPTER VII

USE OF HEALTH FACILITIES RESOURCES

It is commonly understood that colleges offering health professions programs must collaborate with hospitals and other off-campus clinical/laboratory facilities in the educational process. On the other hand, it is increasingly accepted by higher education institutions that they must play a very active and leading role in constructing and directing health professions programs, rather than "passively granting blocks of academic credit to outside programs, which (are) never surpervised, never evaluated, and rarely assisted."(1) Finally, a pivotal role in health professions curriculum development is usually acknowledged as resting with health professional organizations and specialty societies which directly, or through their members' work and teaching activities in hospitals, "provide feedback from the front line of patient care to the educator in the clinical field....(which) is essential to keeping programs up to date and relevant."(2)

The critical issue in balancing the interplay between each of the above factors is the realization that above all else health professions education is concerned with the teaching of occupation-related understanding and skills. Ultimately, what happens to patients is the justification and measure of the health professions programs, and the testing ground is located in the clinical setting. It is for this reason that practical, work-oriented experience is an organic part of the health professions curricula, to an extent unknown in other academic areas. It behooves us, for this reason, to be especially attentive to the procedures and standards essential to insuring the quality of the clinical components of these curricula.

Although no single approach to the use of clinical facilities can be devised to fit all curricula, the following suggested guidelines were prepared at our request by Rose M. Channing, Director of the Division of Health Technologies, at Middlesex County College, for broad application with appropriate adjustment to specific programs:(3)

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(1) "Control and Direction of Allied Health Education: Roles of the Medical Specialty Society, the University, the Junior College", Colin R. Macpherson, M.D., Journal of the American Medical Association, October 11, 1971, Vol. 218, No. 2, p. 8.

(2) Ibid.

(3) Channing, Rose, "The Use of Clinical Facilities by Colleges and Universities". An unpublished input paper prepared for the N. J. Department of Higher Education. September 1971.

What can be accomplished in the college laboratory depends upon several factors related to the nature of the particular health service career for which the student is being prepared, such as the extent and degree of complexity required in handling equipment, amount of direct patient contact associated with a particular service, the amount of knowledge and skill necessary during the program before the student can effectively learn from clinical experiences.

The college laboratory can be used very effectively in preparing students to maximize efficiently and productively, their time in actual situations. Application of scientific principles can be tried in the laboratory and manual skills can be practiced. In those services where patient contact is minimal, such as medical record technology, dental laboratory technology, or medical laboratory technology, larger proportions of time can be scheduled for the college laboratory and experience in the clinical field may come later in the program. Nursing, on the other hand, requires clinical experience fairly early and runs concurrently throughout the program, while programs such as dental hygiene and radiologic technology require certain manipulative skills before the clinical experience can become meaningful or fruitful.

Related factors include availability of laboratory space and budgetary commitment to specialized equipment. A larger capital outlay, maintenance and operating expenses are to be expected for such technologies as radiologic, dental and inhalation therapy, while lesser ones can be anticipated for those such as nursing and medical records. Regional planning and space utilization are factors to be considered in planning for economic and efficient use of college laboratories.

Colleges, then, planning for the use of clinical facilities, must first clearly identify those learning experiences which will meet the objectives of the clinical courses best through clinical experience. Behavioral objectives will serve as guides to determining: 1) where the experience can be obtained, 2) the point in the curriculum at which it begins, 3) sequence of experiences, 4) hours and credit allocation, 5) complexity of situations and planned experiences, 6) extent of direct supervision and by whom.

There are many kinds of agencies where students may meet clinical experience objectives: hospitals, nursing homes, clinics, specialized institutions, physicians' and dentists' offices, nursery schools, schools, industrial plants, public health agencies, health centers, laboratories, etc. These facilities become the clinical laboratory and serve as extended campuses. Students move within the agencies and are assigned to those areas where specific planned experiences are available which will meet course objectives.

As the curriculum is planned or when changes and/or expansion is involved, college personnel will find the following steps in planning helpful (once it is determined that a program is needed):(4)

1. Determine kind and number of agencies required to meet the needs of the program.
2. Develop working relations with community agencies to promote cooperation.
3. Develop criteria for selection of agencies.
4. Visit and survey agencies for
    a. approval and accreditation of appropriate authorities.
    b. quality of facilities, resources and client care.
    c. capacity for students and faculty
5. Arrange and participate in conferences
    a. with appropriate administrative personnel.
    b. with appropriate staff.
6. Draw up broad, general written contract.

The first step is an important advance planning factor. Before attempting to develop working relations with clinical agencies, college personnel must have clearly enunciated the philosophy, and objectives of the program. To convey understanding and gain acceptance of the college program, the characteristics of the program and the expected competencies of its graduates must be presented to the agencies by a committed college representative. The use of Advisory Committees are especially helpful.

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(4) The discussion which follows should be read in the context of Chapters X and XI, which address the use of Comprehensive Health Planning "B" Agency manpower subcommittees as an advisory body to HPEAC on the manpower need for proposed programs and their projected use of clinical facilities. This Chapter's discussion of an individual college's activities in planning for clinical course components, does not negate the need for coordination on a plane transcending the concerns of the separate institutions, to avoid competition and enhance quality controls.

In the second step, developing working relations, several meetings may be necessary. Planning to alternate the site of meetings between the college and agency will contribute to a mutual understanding and appreciation of each. The exchange of views should not only involve administrators, but include, at appropriate times, college faculty and agency staff.

Step three calls for the development of criteria for selection of clinical agencies. Each program establishes its own criteria; however, there are several resources with specific guidelines available for use. (5)

Step four calls for survey visits to each agency under consideration. There should be available for review evidence of appropriate accreditation and approval. The areas considered for student experience should be visited and observations made as to the adequacy of the facility, the quality and quantity of equipment and resources available for care and for student experiences, the kinds of clients, the staffing, the quality of care, the adequacy of records and the attitude of staff toward the program.

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(5) National League for Nursing. Guiding Principles for Junior Colleges Participation in Education for Nursing. Code No.: 16-80, 1961.

National League for Nursing. Arrangements Between an Institution of Higher Education and a Hospital Concerning the Provision of Hospital Facilities for College Education in Nursing. Code No.: 15-776, 1959.

American Association of Junior Colleges. Extending Campus Resources. Washington, D.C., 1968.

The University of the State of New York, The State Education Department. Guide to Selection of Clinical Facilities for an Associate Degree Nursing Program. New York, 1965.

American Hospital Association. Statement on Role and Responsibilities of the Hospital in Providing Clinical Facilities for a Collaborative Educational Program in the Health Field. Chicago, Ill., 1967.

There should be available adequate supporting services for students and college faculty such as parking, dining facilities, lockers for personal belongings, conference rooms, library resources and/or study space for students and work space for faculty.

Step 5 becomes necessary as plans are advanced. Conferences need to be scheduled for two purposes: 1) orientation of agency staff to program and orientation of college faculty to clinical area, 2) planning meetings for specific scheduling of students by name, day, hours and assignments. As the cooperating relationships progress, regularly scheduled evaluation meetings should be planned. College faculty and agency staff directly involved with the experience should meet with administrative personnel to evaluate the arrangement and incorporate appropriate changes.

Step 6 involves the culmination of arrangements in a written contractual agreement between the agency and the college signed by the chief administrators of each institution. Terms of contracts will vary according to policies of either institution, but generally they will include the responsibilities of the college, the responsibilities of the clinical agency and mutual responsibilities.

College responsibilities include overall curriculum planning, implementation, administration and evaluation; appointment and provision of faculty; admission, promotion, and graduation of students; selection of specific experiences; scheduling of students; keeping of records and reports; orientation of agency staff to educational program; compliance with agency policies, rules and regulations where they pertain to activities of students and faculty and provision of liability insurance for students and faculty.

Agency responsibilities include orientation of college faculty to clinical facility; provision of clients, resources (material and personnel) and equipment necessary to carry out planned experiences; provision of policy and procedure manuals and provision of supporting services.

Mutual responsibilities include planning and evaluation meetings.

The language of the contract should be flexible enough to permit change yet definitive enough to serve as a guide. They should be renewable at reasonable time limits and contain terms for termination if necessary.

Mrs. Channing goes on to recommend the creation of regional councils to plan the use of clinical facilities among the different educational institutions. It will be recalled that that recommendation was incorporated in our earlier discussion on institutional sharing of resources.(6) We reemphasize its importance, of course, in this context as well, and make the following supportive recommendations:

Recommendation #1 - To facilitate the pooling of information concerning the wide variety of health facilities resources available, an accurate and comprehensive statewide data bank which would inventory the specialized facilities available, and identify the number of students they could support for specific learning experiences, should be established by HPEAC. Where such information is readily available from such agencies as the Hospital Research Educational Trust of New Jersey, it of course should be utilized.

Recommendation #2 - In its review of health professions education programs, the HPEAC should employ the use of site visits to support facilities when deemed appropriate, in addition to reviewing information and endorsements from the colleges, accrediting bodies, etc. The HPEAC should develop standard questionnaires for receipt of information on health professions programs, applicable to the clinical as well as other program aspects.

Recommendation #3 - The HPEAC should stimulate the development of innovative scheduling patterns through expansion of the capacities of existing resources, including the extension of the hours of use and the judicious sharing of off campus facilities by several institutions and a variety of health professions programs.

Recommendation #4 - The HPEAC likewise should encourage the identification and investigation of health facilities presently underutilized for health professions education purposes. Given the changes taking place in the patterns of health care delivery, the patterns of clinical experience should reflect as much as possible future health delivery systems. Wherever appropriate, health personnel should be rotated during their studies through a variety of service centers in addition to hospitals, including family care and community health centers, group practice and ambulatory care units, and a variety of structural arrangements, including alternate forms of health care teams.

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(6) Chapter VI, Recommendation #8.

Recommendation #5 - The HPEAC should also investigate potentials for interchange and transferrability of practicum credits between educational institutions, particularly the acceptability of credits received in two-year programs and both practicum and didactic credits received in free standing programs by four-year collegiate institutions.

Recommendation #6 - The HPEAC should establish a study committee which will analyze the factors involved in possible collegiate reimbursement for use of health facilities, as well as those related to possible DHE support and coordination of hospital related programs at the collegiate level. Recommendations by the HPEAC on these two major issues should be based on analysis of: anticipated impact on collegiate programs; current and projected inventories of range, scope and enrollments in such programs; rationale for such collegiate and DHE support including indicated operating requirements and standards to be established by these funding institutions; formulae delineating educational from service components of clinical activity upon which funding might be equitably established.

CHAPTER VIII

FACULTY PREPARATION AND DEVELOPMENT

The further development of health professions curricula raises anew the question of appropriate preparation for the faculty in these programs. Practical experience and expertize in radiologic technology, for example, offers no necessary insight into the problems and procedures of the teaching-learning process. The proliferation of new teaching methods and technologies offers the promise of further assistance to the instructor. But this also will require a trained discrimination in their use lest innovation becomes a facile end in itself.

Throughout the nation, moreover, situations can be cited where educational administrators have decided that their institutions will adopt new approaches to teaching but have failed to provide for early faculty familiarization with these techniques before launching their programs. Such failure usually results in a heavy investment of equipment and materials which is mis- or underutilized because the faculty has not been taught how to include these as part of the total educational process.

An AMA task force report on instructor preparation(1) notes that "students . . . exposed to superior teaching methods in elementary and high school are dissatisfied with the traditional lecture method, textbooks and true-false examinations, too often found in post-high school educational institutions." The report goes on to inventory some eighteen colleges and universities offering programs in fourteen states to prepare faculty for allied health education. The report notes that these programs produce teachers who are educated in terms of team teaching, core curricula concepts, career mobility, contemporary learning theories including behavioral objectives, the use of modular instructional units, equivalency examinations, programmed materials and audio-tutorial equipment, microteaching, individualized and self-paced instructional approaches, and the domains of the learning process.

These programs vary, both in length, format and the level at which they are offered. They include special workshops, institutes and seminars for experienced health professionals already engaged in or planning to teach their respective occupations. They range all the way to the more formal baccalaureate, masters and doctoral level programs combining additional study in the health field with pedagogically oriented subject matter.

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(1) "Instructor Preparation for the Allied Health Professions and Health Occupations", First Edition, July 1, 1971, Task Force on Instructor Preparation, Advisory Committee on Education for the Allied Health Professions and Services, Council on Medical Education, American Medical Association.

It is not our intent to prescibe here the specific modes to be used in the preparation and reinforcement of faculty teaching skills in the health professions education programs in New Jersey. Differing occupational categories incorporate divergent needs and possibilities and hence will require differing approaches. Appropriate institutions should explore and develop programs to meet these varying requirements.

It is a conclusion of this study, nevertheless, that the clinical faculty for the health professions programs, usually should be recruited following their acquisition of both subject matter proficiency "on the job" and a formal pedagogic preparation sequence of appropriate duration. One without the other, as a general rule would not result in clinical faculties capable of properly melding the academic and work worlds. At least three years of prior professional experience in a specific health care field is not an unreasonable entrance requirement for formal programs to prepare health professionals for their teaching responsibilities. The absence, in New Jersey, of any formal programs for the preparation of health professions educators leads us to make the following recommendation:

Recommendation #1 - That those colleges and universities within the State which presently offer teacher preparation programs, together with institutions with significant commitment to health professions training programs, should create joint programs which would offer a curriculum package in effective teaching techniques as a minor area of concentration for persons who are engaged in specific health professions careers.

This recommendation is designed to encourage graduate and baccalaureate level programs to investigate the creation of a curriculum option combining professional learning opportunities with those related to competency in teaching. Where faculty are hired who have not had any background in teaching methodology, or a combined professional-educational formal degree program, it is recommended that:

Recommendation #2 - All institutions which offer health professions education programs should encourage their faculty to pursue continuing education programs designed to enhance their teaching skills.

With respect to Recommendation #2, in-service, non-degree sequences, as contrasted with lengthier formal degree programs, should be given appropriate consideration. Strengthening the understanding and skills of relatively mature individuals for their roles as teachers, should not require the frequently tedious, self-proliferating curricula too often associated with teacher education. Careful diagnosis of the lacking teaching skills of prospective and working faculty, accompanied by the prescription of individualized, intensive reinforcement programs, may prove the most efficacious method of meeting this need. Identification of health professionals also possessing demonstrated skills in teaching to conduct such programs for their colleagues, may well prove a desirable alternative approach than one which relies upon traditional teacher preparation staffs.

In addition to these concerns, these programs might incorporate a professional core designed to complement and extend the teachers' subject matter expertize. One important function would lie in their assisting faculty to obtain a broader overview of their professional fields. This will be particularly important when previous work experience may have been fairly specialized in focus and devoid of any educational demands. Many of the occupational categories comprehend activity in a series of sub-specialties, and practitioners may lose touch with developments in one or more of them. Bringing together both teaching and professional development in an in-service program may therefore be the most educationally profitable faculty preparation technique.

In addition, despite full, up-to-date knowledge in their occupational fields, even expert practitioners may need assistance in conceptualizing the material to be covered in a course or curriculum. Familiarization with available texts and other aides for course presentation purposes, may likewise be a useful aspect of refresher sequences for clinical faculty.

It follows from the above considerations, finally, that faculty preparation programs should both be capable of drawing upon institutional strengths in the health professions subject matter areas, as well as those in teaching. Inter-collegiate joint program approaches may often be necessary in order to aggregate the necessary resources.

Turning to another aspect of joint program approaches to faculty development, it would seem that considerable insight into the upgrading of individual faculty effort could be obtained through regional and state-wide sharing of information, techniques and resources among faculty in similar programs. In other words, not only should the directors of various health professions education programs throughout the state familiarize themselves with each other and work together to develop more standarized curricular formats, unit modules of instruction and teaching ladders, but their faculty also should be involved in cooperative efforts to develop appropriate learning strategies, teaching aids and evaluation procedures for those sequences and courses for which they are all responsible. To this end it is recommended that:

Recommendation #3 - On a regional, and where possible, statewide basis, program directors and faculty engaged in similar programs should conduct on-going workshops for the sharing and improvement of teaching resources; the development of guidelines to evaluate teacher performance; and the establishment of mechanisms to assure that standards are being maintained, including use of student evaluations. Special attention should be given to developing faculty sensitivities and skills in the education of disadvantaged and minority students. Evaluation of teaching performance and maintenance of academic standards are ultimately the prerogative of the faculties of the individual institutions.

The issue of whether faculty preparation should primarily emphasize teaching skills, as opposed to clinical skills, is regarded as essentially arid. The responsibilities of faculty in health professions education programs comprehend the two areas, and they should be prepared to discharge both.

CHAPTER IX

RESEARCH IN THE HEALTH SCIENCES

The chief benefit which is to be realized by State funding of research is the attention which can be given to fulfilling some of the unmet needs of the State and to achieve a better balance of overall effort for the development of excellence in the institutions within the State. Funding of research on a national basis, whether by way of the Federal research budget or by way of the commitments of major foundations, is predicated almost entirely upon what may be generally perceived to be national needs and priorities. Neither of these funding sources give substantial attention to the unique qualities or the unique needs of the State of New Jersey.

Research into the health problems of mankind, moreover, comprises a major part of the general commitment to research made by every institution of higher learning, especially by every institution that awards advanced and professional degrees. The support of research activities in institutions of graduate and professional education is necessary, also, in that (a) as faculty members are involved in research they provide current and appropriate training for their students; (b) the successful maintenance and recruitment of faculty members of good quality presupposes the availability of research funds and facilities; and (c) rather than the research experience siphoning off practitioners into careers in research, the appropriate education of tomorrow's practitioners is in an environment which can provide a broad and sophisticated understanding of the current state of the sciences on which the practice is based so that the future practitioner can have a clear appreciation of major trends and findings in the pertinent basic and clinical fields of research. Faculty time obtained via research funding can also release some funds for use in alternative educational activities.

It is thus generally accepted that scientific education of a high quality can be pursued at graduate and professional levels only when quality research is simultaneously established and regarded as a normal activity. From this, it follows that there is no true advanced training or education in the health-related professions at any given institution until and unless there is research in those sciences.

In addition to the responsibility of providing its advanced students with research participation, a publicly-supported system of higher education has a further commitment: to public service. A large part of this commitment takes the form of health-related research. The land-grant colleges, as they were originally established, were essentially colleges of applied biology, and as they developed, have taken on more and more responsibility for improving mankind's health and the general quality of human life. Major contributions to those ends, like streptomycin and the Salk vaccine, are known to everybody; what is often forgotten is that dramatic discoveries like these are possible only in a general context of sound scientific activity. Any plan for higher education on a state wide basis must incorporate provisions for the conduct of health-related research at institutions which grant advanced degrees.

The Carnegie Commission on Higher Education also indicated that "a vigorous biomedical research program is essential for continued progress in combating disease and that it is an integral component of the process of medical and dental education."(1) It also recommended research on "needed changes in health manpower education and in the delivery of health care."(2)

Such research is very expensive. Ultimately the financing of health-related research, like the financing of all research, is in the hands of laymen, of non-scientists. Thus the United States Congress annually appropriates over two billion dollars for the research programs of the Public Health Service, and such foundations as Ford, Johnson, Rockefeller, Carnegie, Sloan, and Kellogg invest millions each year on projects concerned with aging, cancer, heart disease, mental health, nutrition, health manpower education, health care delivery, the application of computer science to biological and medical problems, and the like. Yet despite the large-scale support of health research by private foundations and the federal government, support is also needed from the State.

There are two reasons why state support is required to supplement private and federal monies. Both reasons stem from the fact that all federal and private money is properly competitive, but may be categorically restrictive.

Research in the health sciences is increasingly multidisciplinary. The solution of contemporary biomedical problems requires coordination of the efforts of clinical and laboratory investigators, and it is essential that more research in the health area be performed cooperatively by social and natural scientists. A program should be organized which will provide funds for clinical, natural and social scientists, and business administrators, to work within their disciplines and as members of teams performing research in the health area at appropriate institutions of higher education.

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(1) Higher Education and the Nation's Health: Policies for Medical and Dental Education. Op. Cit.

(2) Ibid.

Since individual scientists must compete with other scientists for a grant from the Public Health Service or from a foundation, a peer merit system of decision-making is used in all allocations of such funds. In a competition of this kind, a younger scientist who has not yet published is at a distinct disadvantage and will remain so until there are funds to equip the laboratory, employ assistants, buy supplies, conduct experiments, and publish results. Each of these steps can be costly; each, if it is to be accomplished, must be financed--but it will not be financed except by a local agency, namely, in the case of a state-supported institution, by the State.

Second, an individual university, medical or dental school must compete with other universities and schools for the larger developmental grants; the various institutions of higher learning need State support to prepare for such competitions. State money is also needed to cover expenses specifically excluded from grants and contracts but necessarily incurred in the conduct of research. The present tendency of the federal government is to reduce support for research, even though the Carnegie Commission has recommended more federal funding in these areas. The role of the State is becoming increasingly important.

Although health-related research is undoubtedly expensive, it does improve medical care. Preventing a disease is more economical than treating a disease; knowledge of disease is necessary in both cases. Thus, far from being a drain on the state's resources, money allocated to research is money invested in the health and welfare of the people. In short, non-federal money is needed to attract federal money, non-foundation money is needed to attract foundation money. There is an immediate need to create a pool of information to educate foundations and legislators concerning health research funding needs in the natural and social sciences. It is, therefore, recommended that:

Recommendation #1 - *A New Jersey Health Research Advisory Council be created to recommend policy and to advise the Department regarding necessary but unmet health related State research needs to be performed by educational institutions, to encourage support for research in areas not available from other sources, to identify research goals, and to recommend overall funding levels. The Council should be composed of representatives of institutions of higher education, health provider agencies, citizen groups, the public, as well as the State Departments of Health, Institutions and Agencies, Environmental Protection and Higher Education. This Council would encourage inter-institutional cooperation and interdisciplinary research, and would evaluate issues* *balancing the needs of basic and applied research. An especially important area of concern will be research, demonstration and evaluation of changes in the health care delivery system, based upon input from the clinical, natural and social sciences. This Council would recommend the distribution of state funds and coordinate interdisciplinary programs. The Council should not encumber or restrict institutions in their search and negotiation for private or federal monies.*

CHAPTER X

MANPOWER NEEDS IN THE OCCUPATIONAL CATEGORIES

IMPLICATIONS FOR INSTITUTIONAL PROGRAM RESPONSIBILITIES

The Health Manpower Data Project of the N.J. Department of Health (HMDP) contains supply and demand projections for the planning horizon of 1985 (Appendix E). These supply and demand projections forecast an increasing shortage of personnel in many of the health manpower occupational categories (HMOCs) studied. Providing these future manpower needs is the responsibility of New Jersey's higher education institutions.(1)

In our further analysis of the HMDP data and the conclusions and recommendations drawn from them, we have been cognizant of a growing skepticism which several respected authorities in the health manpower field are manifesting with regard to some recent warnings of overwhelming shortages of personnel. Most succinctly, Dr. Eli Ginzberg, Director of Columbia University's Institute for the Conservation of Human Resources, has noted:(2)

> "Community colleges are taking over a good bit of health manpower training from the hospitals, and this must always be adjusted to local conditions. One of the problems of the smaller junior colleges is that they start a program for, say, medical technicians or LPNs, and very soon the local market is glutted. If the area has two hospitals, and you train five medical technicians at a time, then in a couple of educational cycles you've turned out 10 or 20 of them. That's all the local hospitals are going to absorb for a while, even though a high proportion are women and tend to leave the field at least temporarily... Yes, we could use some additional health manpower. But I disagree with the extravagant estimate, developed by HEW some years ago and since repeated, that we need 10,000 newly-trained allied health personnel a *month*! From the data I'm acquainted with, it would be hard to pinpoint more than a few thousand openings in the whole of the United States..."

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(1) Our use of the terminology supply, demand and need bears some definition since these phrases carry different connotations in other contexts: Supply is the number of personnel active and available; Demand is the number of personnel deemed necessary to properly staff the health delivery system; Need is simply the gap between supply and demand.

(2) "Paramedics to the Rescue?", Medical Economics, May 10, 1972, p. 110.

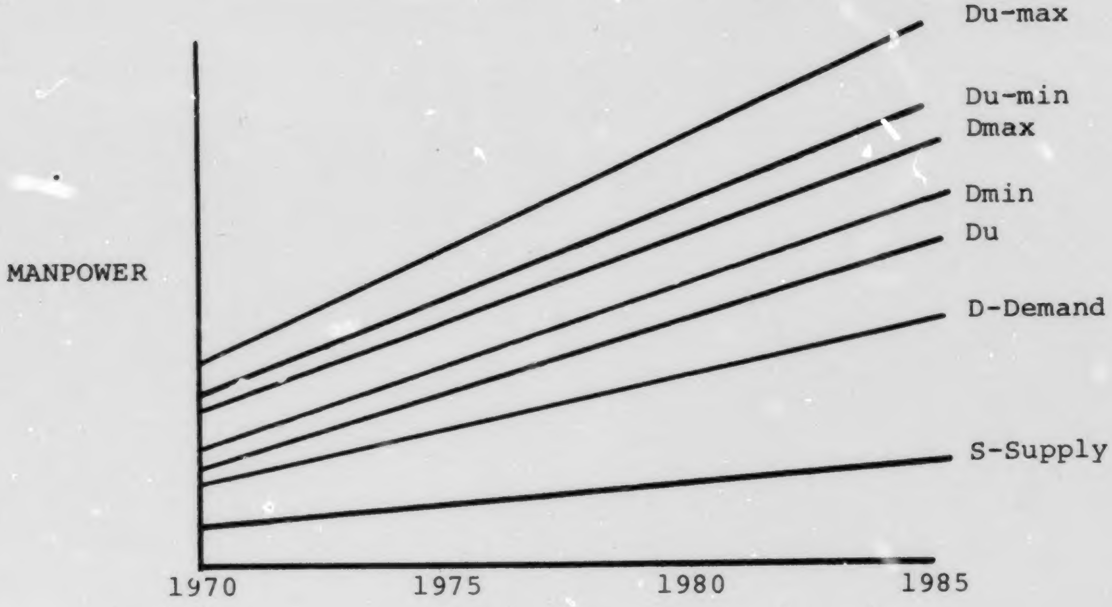
Therefore, in determining the scale and type of programs which can best meet future needs, this section offers a planning framework or matrix within which decisions can be made for each of the HMOCs under study. Given the fact that the projections at best represent informed estimates, that the base data available are not always of the highest quality and that the changing nature of the health delivery system could invalidate our various assumptions, we do not propose to view or use the manpower need determinations as absolutes. To supplement this plan's manpower projections, therefore, locally derived substantiating data will be required, based on surveys reflecting employer requirements and intentions. Moreover, in those HMOCs where the educational process is relatively less costly and lengthy, the HPEAC and Department should treat the need for new programs, or significant enrollment expansions of existing programs, more flexibly than in the case of curricula making heavy resource demands.

It will be noted that not all of the HMOCs addressed in this chapter are analyzed in terms of quantified manpower needs. In such fields as physician's assistants, where there exists little experience, much less data, upon which to base projections, one is left in the position under our methodology of trying to factor from zero. Hence, only a qualitative approach has been taken to identifying our responsibilities in such fields.

Where we can address manpower needs quantitatively, the data which defines future educational program responsibilities is presented graphically in separate HMOC sections in the latter part of this chapter. Figures related to total State needs are drawn from Section 4, Tables 10 and 12 of the HMDP; those broken down on a regional basis are drawn from the appropriate occupational sections of Tables 11 and 13. These tables incorporate the basic demand projections, plus an additional combined adjustment of demand resulting from presently unmet manpower requirements and the anticipated effect of "maximum" and "minimum" impact national health insurance legislation. Thus, the basic manpower demand projections shown in Section 4, Table 1 of the HMDP, are increased first to adjust for presently unmet requirements (Table 4), and then for the manpower demand effects of the minimum and maximum impact of national health insurance legislation (Tables 7 & 8).

On page 83 is presented a guide which attempts to display visually how the HMDP calculations build up the demand lines employed. Neither that guide nor this brief summary, however, constitute a sufficient review for those seriously interested in tracking the HMDP reasoning and the complex issues it addresses. Only a reading of that document itself will serve such purposes.

GUIDE TO SUPPLY/DEMAND MANPOWER DATA



S = Basic Supply Line - Based on past trends. In Medicine and Dentistry where recent trends are unclear, two different supply lines have been calculated.

D = Basic Demand Line - Based on supply ratios multiplied proportionally by projected population increases (a) + projected income increases (b) + an interaction (ab). In Dentistry, Dental Hygiene, Dental Laboratory Technology, Physical Therapy and Pharmacy where future basic demands might vary, two different demand lines have been calculated.

Du = Demand based on the basic demand projection + a calculation of current unmet needs as expressed by the number of presently budgeted, but unfilled positions.

Dmin = Demand based on impact of minimum projected national health insurance legislation + basic demand (D).

Dmax = Demand based on impact of maximum projected national health insurance legislation + D.

Du-min = Demand based on impact of minimum projected national health insurance legislation + unmet needs + D.

Du-max = Demand based on impact of maximum projected national health insurance legislation + unmet needs + D.

We do feel it necessary, however, to expound further on one aspect of the HMDP analysis: serious questions have been raised by some commentators who have had an opportunity to review the methodology as to the advisability of accounting for the ambulatory mode of health care service delivery in the determination of manpower demand. The underlying question concerning this point, it appears to us, is whether it is possible to account for such a factor even if one grants that an accounting seems desirable, considering the hopefully continuing trend towards this delivery mode. For this reason, Mr. Vincent Martucci, of the HMDP staff, has provided the further discussion constituting the below footnote.(3)

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(3) "As noted in the HMDP discussion of methodology, the assumption is made that in order to determine the demand for manpower, one must calculate the effect of the changes in population and income upon the demand for health services. The manner in which population changes were converted into health manpower demand involved the determination of the historical usage of certain health services by various segments of the served population. The medical service utilization data was available in three distinct categories: hospital patient days; physician visits; and dental visits. Traditionally, the federal government has collected and reported such utilization information according to an age and sex breakdown of the served population. During the course of the manpower study it seemed quite rational and logical to use this type of activity data to characterize the medical service demand for forecasting purposes. Thus, it remained a matter of matching each of the health occupations under study with that particular type of medical service which most closely allied itself with the usual functions and locale of the occupation in question.

"Therefore, the physician demand calculations were based upon 'physician visits' information, dental manpower demand (including dentists, dental hygienists, dental lab technicians) was based upon 'dental visits' information, and so on. As was pointed out in the HMDP, some of the occupational categories could not be directly linked to the medical service utilization data and thus the manpower demand calculation was predicated upon predicted increases in the population rather than the population's increased usage of services.

"During the time that the manpower demand factors were being analyzed for computation purposes no specific data was uncovered regarding the relationship of outpatient service utilization statistics and the corresponding manpower categories which would be closely allied to the delivery of such services.

On the other hand, we had hoped to be able to measure the effect on manpower requirements of the increasing introduction into the health delivery picture of Health Maintenance Organizations. On page 232 of the HMDP it is noted that the requisite analyses are not yet available, although several hypothetical major effects are listed given the existence of a large number of such operational organizations. We anticipate that well before their introduction and growth begins to have a critical effect upon these projections, future updatings of this plan will reflect their impact.

Several additional factors have not been directly addressed. For instance, the projections assume that present medical knowledge, technology and relative productivity will remain fixed. While this is obviously not the case, neither do we have any way of forecasting precisely what these changes will be, what effect on manpower requirements they will have, when they will occur and at what pace they will be introduced. Consequently, our best judgment is that such factors should not be incorporated into our future projections, except in those instances(e.g., as has been done in the case of productivity increases for pharmacists) where significant consensus exists that such changes are more than conjectural. Moreover, we believe that by frequent periodic updating of the forecasts, it will be possible to reflect such changes in a realistically accurate manner.

In several instances, we have taken cognizance of the influence upon manpower needs of supply changes and expanded duty assignments between closely related HMOCs. This is most clearly the case with dental health personnel, hence their closely interrelated treatment later in this chapter. It was not found possible to make precise,justified, interrelated projections with respect to physicians and physicians' assistants, although this clearly should be anticipated. Nonetheless, due to such anticipation, our recommendations in the physician category do not seek closure of the projected gap between their supply and demand, in part because of the expected impact of the availability of physicians' assistants.

(3 - cont.) "Until such time as the method of acquiring such information becomes standardized, it is felt that the incorporation of the various adjustments to the manpower supply and demand findings will satisfy and encompass any shortcomings arising from the apparent exclusion of outpatient service utilization data.

"In point of fact, the New Jersey State Department of Health, through its implementation of the 'Health Care Facilities Planning Act', will start to correct this data deficiency by requiring the reporting of outpatient service statistics. When the data categorization and collection procedures are in full operation, it is anticipated that more specific service/manpower correlations can be made." -- From a letter to E. Cohen, April 17, 1972.

Several commentators have questioned whether the forecasts take cognizance of attracting back to work greater numbers of retired or non-active professionals, in lieu of recruiting and educating new personnel. The methodology does reflect the current rates of return, but again there is no basis for justifying changes in those rates; nor can institutions of higher education have any but a marginal influence on such rates of return. To be sure, our intention to update the forecasts (including supply data) periodically will insure that future projections reflect such changes as do occur.

It has been noted that the effect of prices on demand have not been considered. This is indeed a factor which future updatings will correct. However, whether the accretion of this factor, in the context of all those others which have been considered, will have a significant effect on the projections cannot be determined at this time. We will also be examining intra- and inter-occupational mobility, including movement between types of health professions (e.g. dentistry, medical, nursing) as well as movements between such fields as nursing and medicine. Conceivably, this type of mobility could have important effects on assumptions about output and productivity and, consequently, on demand for the various individual health manpower occupational categories.

There remains a number of other questions that have been raised concerning whether our supply and demand projections are sufficiently accurate to anticipate future trends. It has been noted that our projection model is based upon a linear form and that we should have considered other more complex mathematical forms in order to insure that our independent variables (population, income, health insurance, etc.) are in fact independent. Our experience has shown that linear forms are as accurate as any other of the non-linear models that are used in manpower forecasting. In general, the choice of the functional form, whether linear or non-linear, and with single or multiple inputs, depends upon the closeness of the fit of the model to the data. The master plan model was chosen because of the significant correlation between the dependent and independent variables and because the parameters of the model (e.g., income elasticity) were statistically significant. While the model assumes linearity in the parameters of the regression equations and independence between the independent variables, our forecasts, however, are not invalid if independence is absent. For the purposes of forecasting we need only make the assumption that the established relationships between the above variables continue to exist. Even if the relationships change, they generally change slowly and our forecasts can be revised in light of the new information.

We have indicated above that additional variables such as price and productivity should be incorporated into the model, and that we are currently examining the impact of these variables on the demand for health manpower. We are also aware that there may be many other variables that should be considered. We can only suggest that models, regardless of their complexity, will exclude some variables. The choice of those variables which are to be included in the model must always be made in terms of choosing those variables which are likely to have an obvious and immediate impact on the dependent variables (i.e., the demand for health manpower). These variables must also be quantitative in nature and projectable. The variables that are generally excluded from the model are qualitative. The rationale for excluding these variables is that their net effect is likely to be zero. In some cases, however, this assumption will not be valid and while this may appear to be a serious limitation in the forecasting model, it may not be in most cases. If the excluded (qualitative) variables tend to be correlated with the included variables, then the coefficients of the model will generally reflect the combined effect of both the included and excluded variables. For example, education, age and income should have separate and independent effects on the demand for health manpower. Excluding age and education from the model, but including income would not seriously distort our projections, because age and education tend to be related to income. Therefore, the coefficient relating the demand for health manpower and income (i.e., the income elasticity) will reflect the correlation between the included and excluded variables.

It has been suggested by some that our demand projections might be too high in view of the decline in the birth rate and the possible lack of resources that would be required to maintain continued population growth. It is true that we have not yet taken account of the decline in the population growth rate in developing our population projections. The current population projections are based upon information supplied to us by the United State Department of Commerce. The information we have indicates that the New Jersey State Department of Labor and Industry does not intend to revise its projections of New Jersey's population, as they feel that New Jersey has historically lagged behind the rest of the nation in terms of its population changes. The reason for this lag is related to the transient characteristics of New Jersey's population. This is further supported as New Jersey demonstrates a higher proportion of women within child-bearing age limits than does the nation taken as a whole.

The projected growth in population and income presupposes the availability of resources to permit continued growth in the demand for health services and in the demand for health manpower. We find no evidence to suggest that the resources that are needed to allow such growth will not be available in the future. New Jersey has experienced, as have other states, an orderly growth pattern. It is the impression of those at Labor and Industry who are concerned with the general economic development of the state, that given the normal changes in economic and social activity over the next fifteen years, New Jersey should be able to grow at least at the same rate as it has grown in the past. It is our feeling, therefore, that New Jersey can continue to expect significant gains in population and income.

These factors will certainly lead to continue increases in the demand for health services and health manpower. It is, furthermore, well documented that physicians' and other health manpower in-migration patterns are heavily influenced by population and income growth and we would not expect significant departures from our projected growth trends in the supply of health manpower.(4)

In the introductory chapter of the plan we discussed the point that the implicit assumption of the methodology is to project manpower supply and demand based upon a modified status-quo approach; that is, we have assumed that, during the projection period, utilization patterns in the delivery of health services will remain approximately the same as they are today. We believe that this point is sufficiently important enough, because of the many questions that were raised about the effect on our projections of significant changes in the delivery system, to warrant a restatement of the reasons for choosing a modified status-quo model.

Admittedly, changes in the style of practice and the development of new methods of health care delivery will have an effect on the need for health services and the mix of health manpower. While no one will dispute this point, the business of planning requires firm information about what these needs and mixes will be. We do not know now the extent to which the system will change, nor do we know that it will change significantly at all over the next fifteen years. Furthermore, it is absolutely clear from the reading of the literature, from the correspondence that we have received, and from the meetings that we have held, that no one has yet put forth an acceptable definition of what our future delivery system will look like. Consumers have one point of view, while health practitioners and providers have very different views. Even within a given category, the number of permutations of viewpoints are almost infinite. While we may define health goals, it is not clear that consumers will accept them nor will they be willing to finance them. We can speculate about different types of health production systems, but it is unclear whether productivity and manpower utilization will be significantly different.(5) It is, therefore, our feeling that projecting manpower based upon highly speculative relationships between the demanders of health care and the suppliers of health care, as well as equally unclear relationships between different manpower inputs in the production of health services, would only tend to create major inaccuracies in our projections.

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(4) See, for example, The Migration of the 1955-1965 Graduates of American Medical Schools, Ford Foundation Program for Research in University Administration: University of California, 1973.

(5) See, for example, The Effect of Manpower Utilization on Cost and Productivity of a Neighborhood Health Center, Harvard Center for Community Health and Medical Care, 1973, and Physician Productivity Functions and Varying Practice Arrangements, Community Data Profile Center, DHEW 1973.

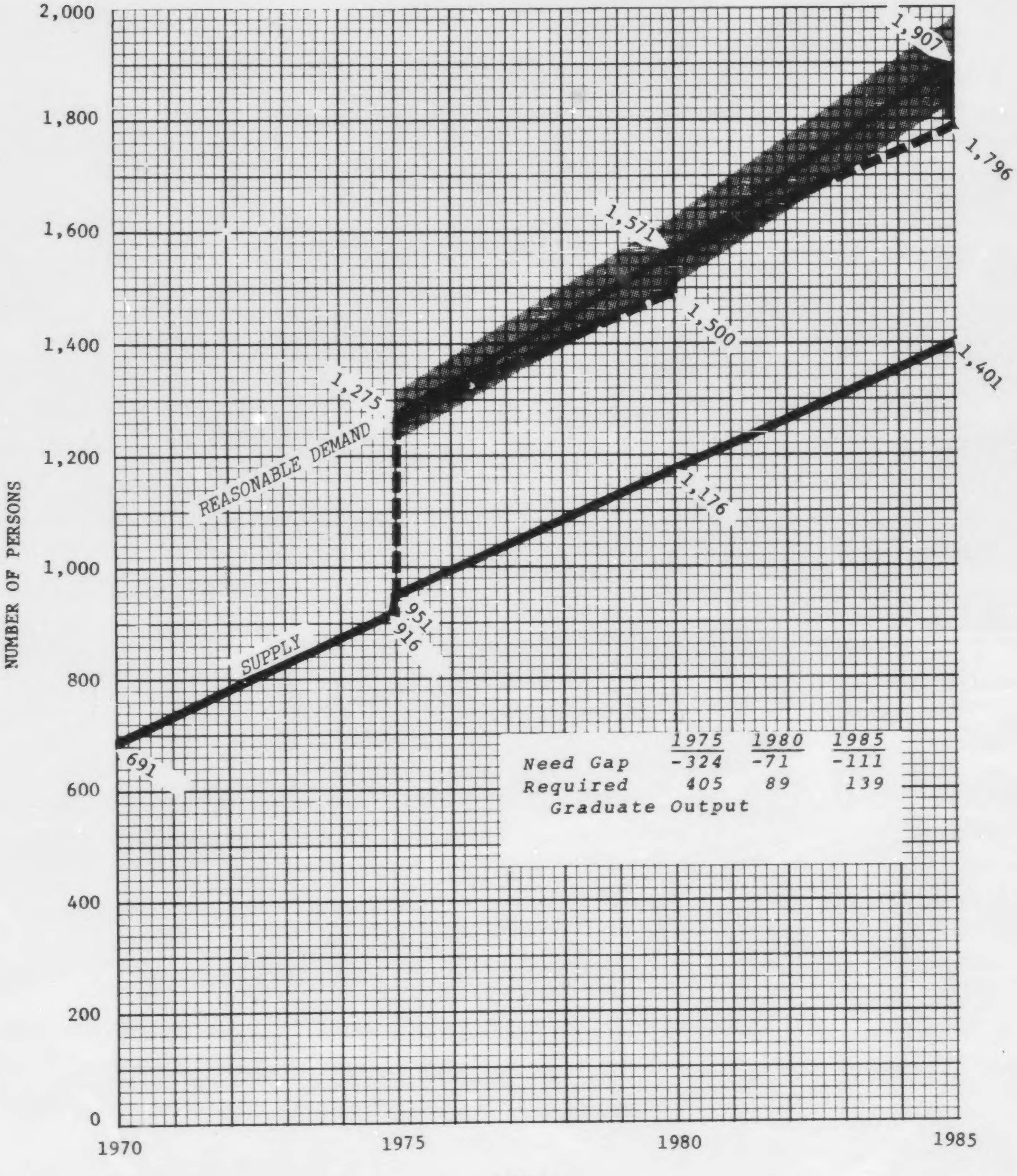
In a further attempt to clarify our analysis of the implications for institutional program responsibilities in each of the relevant HMOCs, a Model Graph (based on statewide figures for dental hygienists) will first be constructed to illustrate generally the procedures followed in the remainder of the chapter (see page 87). Note that the graph is composed of one supply line and a series of demand lines. The latter creates what might be called a national health insurance band, whose upper and lower boundaries are defined by the projected effects of the maximum and minimum impact of health insurance proposals.

These initial projections from the HMDP are further supplemented by us in two ways. First, a reasonable demand line was constructed exactly half-way between the maximum and minimum demand lines. This reasonable demand line does not specifically coincide with any of the anticipated effects upon manpower needs of the four models of national health insurance legislation examined by the HMDP. It is posited to represent flexible goals for program planning purposes considering the present social and political climate. Our underlying assumptions are that the minimum demand line constitutes too conservative a goal, and that legislation will be implemented which will exceed it in impact; and on the other hand, that the upper level incorporates unrealistic expectations. Thus, a simple average between the extremes was chosen for present target planning purposes pending federal congressional action in the future.

MODEL GRAPH

HMOC: Dental Hygienists

Statewide Basis



	1975	1980	1985
Need Gap	-324	-71	-111
Required Graduate Output	405	89	139

A second adaptation to the data is the inclusion of additional manpower units, on the supply line, resulting from programs which have been approved by the Board of Higher Education between 1970, the base year of the HMDP data, and the end of 1971. As an illustration, on the dental hygienists model graph it is estimated that two new programs will produce 42 additional dental hygienists per year. (6) However, less than 42 of these will enter the New Jersey labor force since some dental hygienists will migrate to other states or for other reasons will not be available. To adjust for this, an "in-state survival" factor has been estimated for each of the HMOCs based on the general rule that greater mobility is characteristic of the more extensively trained personnel. Table I lists these survival rates in the HMOCs for which quantified analyses are being presented.

Thus in the example of dental hygienists, an "in-state survival" rate in the work force of 80% would yield a residual increase in the supply line of 34 units. Since all of these new programs are assumed to be operational by 1975 (except for the dentist and physician HMOCs), this increase is reflected in the model graph by the vertical shift or "jog" in the supply line at the year 1975.

Two further decisions underlie the final form of the graphs in the specific HMOC sections which conclude this chapter. The first involves our choice of one demand projection from the HMDP study where multiple projections exist. The other involves a decision of projection basis, i.e., projection on a state or regional scale. The regions of the State were defined in the map in Chapter VI, page 49, "Health Professions Education Planning Areas."

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(6) "Health Manpower Training Resources", N.J. Health Careers Service, based on a November 1971 Survey by the Health Department's Comprehensive Health Planning Office. The data from this survey, with respect to projected enrollments for new programs, was factored by 15% at the baccalaureate level, and 25% at the associate degree level, to arrive at the anticipated number of graduates following in-college attrition in each of the programs. Appendix F contains an updating and listing as of December, 1972, of all approved programs at the collegiate level in the health professions area, including those "free standing" programs offered by clinical institutions.

TABLE I

"In-State Survival" Factors for Quantified Health Manpower Occupational Categories (HMOC)

Manpower Categories (HMOC)	Rates for "In-State Survival" Factor (7)
Physicians	.50
Nurses	
Baccalaureate	.65
ADN	.80
Dentists	.80
Dental Hygienists	.80
Dental Laboratory Technicians	.80
Pharmacists	.75
Veterinarians	.50
Medical Technologists	.65
Medical Laboratory Technicians	.80
Cytotechnologists	.80
Radiologic Technologists	.80
Inhalation Therapists and Technicians	.80
Occupational Therapists	.65
Physical Therapists	.65
Speech Pathologists and Audiologists	.50
Medical Records Administrators	.65
Medical Records Technicians	.80
Dietitians	.65

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(7) These in-state survival rates are distributed on the following bases:
Two-years or less of training = .80
More than two through four years of training = .65
Five years or more = .50, except in the case of pharmacy, for reasons discussed in that HMOC section of this chapter

The numerical value of the survival factor gives us some insight into evaluating the costs and benefits associated with the educational programs considered in the Master Plan. It suggests that the State must always produce a graduate output that exceeds its manpower need. Perhaps this can best be shown by an example:

> A 50% survival factor should be used for veterinarians because their training period exceeds five years. Thus, if New Jersey were to provide the necessary funding to build and staff a veterinarian school, the State must be prepared to spend at a rate that would produce twice as many graduates as would be needed to close the gap between supply and demand.

In the dental hygienist HMOC for example, two projections of future demand were made by the HMDP study. The second and higher set of demand figures in the HMDP study was chosen because it more closely reflects desired changes in the practice of dental care delivery. These changes prescribe the use of increased numbers of auxiliary personnel per dentist. It will be noted, of course, that this decision will affect the choice of dentist demand projection models from the HMDP study, since the dental hygienist demand line selected presupposes a somewhat lower need for dentists themselves. It is that projection approach which appears on the model graph, and such similar choices which will be reflected in the graphs in several of the subsequent HMOC discussions.

In the decision determining the basis of projection, the regional scale was chosen in the dental hygienist category (and will be reflected in the subsequent section even though the model graph charts only statewide data). The rationale behind this decision is three-fold. The first is that there are multiple dental hygiene programs in New Jersey so that responses to needs within regions of the State are possible. Also, as a general rule, dental hygienists are less mobile than more extensively trained health personnel and thus are more likely to practice within the regions in which they are educated. Thirdly, there are significant differences between the regions to justify a breakdown of manpower needs on a smaller than statewide scale.

The rationale for these two decisions concerning each HMOC is delineated in the narrative preceding the graphic presentation in each relevant subsequent section of this chapter. Such assumptions and decisions set the general framework for the construction of the graphs. Logically, proposed programs designed to bridge these manpower gaps should be based on the specific nature of the manpower situation in each of the HMOCs. There are, however, certain broad characteristics which offer guidelines for individual HMOC decisions. These characteristics or trends can be categorized by the relationship of their reasonable demand and supply curves. These sets of supply and demand curves fall into three groups: those sets which are divergent, those which are parallel, and those which are convergent.

In the example of the dental hygiene HMOC, the supply and reasonable demand lines are divergent, indicating that if no new programs are implemented the manpower shortages in this category will continue to increase. Such a condition would warrant a bold approach to bridging this manpower gap. Thus, in the model graph the dotted line patterning new program strategy rises vertically to meet the reasonable demand line. The reason for such a direct closing of the gap is that with divergent lines, any overestimate in the projection of new programs or additional manpower units will correct itself in time. Although, mathematically, a more efficient program strategy might initially call for an oversupply, dropping in time to a shortage and then repeating the process, our present inexperience with the HMDP projections suggests a more cautious approach since future conditions are not perfectly predictable.

This warning would consequently suggest an even more cautious approach if the supply and demand lines are parallel. Further, if the lines are convergent, this would indicate that a very conservative approach is the most reasonable strategy for bridging the manpower gap. Institutional decisions in the last circumstance would depend upon the magnitude of the present absolute gap, the degree of convergence, and the point in time when supply is foreseen as overtaking demand. This might presage in some extreme instances an actual cut-back in present graduation totals; on the other hand, where the numbers of personnel presently lacking is very high in an absolute sense, an existent program should consider increasing its productivity at least on a temporary basis.

Institutional policy decisions also should adjust for the "in-state survival" factor discussed previously with reference to adjusted supply lines. In the example of dental hygienists, on the model graph, the 1975 Statewide gap between supply and reasonable demand is 325 units. In order to close this gap, the number of additional graduates should therefore be larger than 325 to account for this attrition factor. Thus, adjustment based upon an 80% survival rate of the work force would call for a graduating class of 406 dental hygienists. The table inset into the model graph converts each of these gaps into a required graduate output figure on a five year readjustment schedule. The figures for each five-year interval are valid, however, only if the proposed strategy line is followed. Since that line is merely suggestive, the figures shown for 1980 and 1985 in the inset tables would over or underestimate the gap and required graduate output unless the proposed personnel unit increments are met precisely. Similar tables are provided on each of the HMOC graphs later in the chapter.

Finally, it should be noted that the model graph for dental hygienists is different from that presented in the specific subsequent discussion of this HMOC. The difference in the latter reflects a judgmental decision that the manpower gaps which emerge from the HMDP study do not thereby enforce a simplistic strategy of closing them merely by increasing the number of graduates. In many instances, we find that the rate of growth in demand depicted in the HMDP, and/or the manpower utilization factors underlying demand rates, and/or the possibility of taking alternative approaches to securing needed personnel, call for a re-examination of such a monolithic approach or a complete dependence on the HMDP data. It will be noted that in addition to dental hygiene, such departures occur in nursing, pharmacy, as well as other fields.

In the above discussion of the statewide projections for dental hygienists, the reasons for developing projections on less than statewide, or area, bases were also indicated. These include (a) numbers and distribution of present or already approved programs in the state; (b) relative mobility and in-state survival projections; (3) significant economic or other differences between areas in the state resulting in wide variations in supply and demand within or between areas. These same reasons apply to other HMOCs. In addition, for some of the HMOCs, area data were not always available and only statewide projections were developed.

We, therefore, acknowledge that for the above, and, perhaps additional supplementary reasons resulting from specific local conditions, it may be appropriate to recommend approval of individual programs on a very select basis, even where the plan's projections might indicate otherwise. When this is done, of course, such exceptions should be based upon objective findings developed by the institutions, and verified by the appropriate "B" Agency mnapower committee.

In concluding this introductory overview to the manpower forecasting methodology we are using, we concede that weaknesses in the data available and perhaps even in the analytic approach, would dictate that the projections should be viewed only as reasonable indicators of future requirements, and not as fixed quantities. As stated in the plan's introductory chapter, moreover, we will continue to refine the methodology and data bases employed. Within the limits of budget available for this purpose, we intend to update the projections periodically, if not annually, at least every two years, in keeping with our concept that this document will be treated as a "rolling master plan." In this regard we make the following recommendation:

Recommendation #1 - The Departments of Health and Higher Education should engage in a continuing process of improving the data base for health manpower projection purposes, including developing and encouraging the use of comparable and comprehensive registries of personnel. In addition, they should continue to improve the projection model, accounting for relevant variables not presently included in the HMDP analysis. The development of a computer program to facilitate the periodic updating of manpower projections likewise should be pursued.

HEALTH MANPOWER OCCUPATIONAL CATEGORIES

On the following page is a list of the HMOCs which will be addressed in this "first-cut" plan in 1973. They are grouped into what we believe are logical occupational clusters of the type discussed in Chapter VI. As noted in the introductory chapter, it is our intention to analyze additional occupational categories in future updatings of the plan, some in new cluster areas, others to be added to those already addressed.

It will be noted that in the HMOC discussions which follow we do not always present a definition of the functions of personnel in such fields. For the fields it addresses in quantitative terms, such definitions do appear in Section 5 of the HMDP, and are only supplemented in our subsequent discussions when need is seen for clarification of the HMOCs functional parameters.(8)

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(8) We hoped to be able to recommend appropriate terminological usages of such words as "technician, technologist and therapist," but feel we should continue to defer such action pending the attainment of a consensus by the Task Force on Terminology of the Advisory Committee on Education for the Allied Health Professions and Services of the AMA Council on Medical Education. Although agreement continues to elude this distinguished group, favorable attention is being given to distinctions based on the type of tasks performed rather than the length of educational preparation. The issues appear very complex, however, and are moving very slowly towards resolution, as outlined in the most recent March 1972 communication received by the Department from the Task Force. We do not believe there is any virtue in getting out ahead of such a national group on this issue, since we owe it to our students to furnish them with titles broadly acceptable throughout the nation.

HEALTH MANPOWER OCCUPATIONAL CATEGORIES (9)

Physicians - Quantified
Physicians' Assistants - Qualitative Only
Nurses
    Baccalaureate - Quantified
    ADN and Diploma - Quantified
Dentists - Quantified
Dental Hygienists - Quantified
Dental Assistants - Qualitative Only
Dental Laboratory Technicians - Quantified
Pharmacists - Quantified
Veterinarians - Quantified (9)
Medical Technologists - Quantified (9)
Medical Laboratory Technicians - Qualitative (9)
Cytotechnologists - Quantified (9)
Radiologic Technologists - Quantified
Inhalation Therapists and Technicians - Quantified (9)
Occupational Therapists - Quantified
Physical Therapists - Quantified
Speech Pathologists and Audiologists - Quantified (9)
Health Care Managers - Qualitative Only
Medical Records Administrators - Quantified
Medical Records Technicians - Quantified
Health Education and Information Specialists - Qualitative Only
Dieticians - Quantified

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(9) These HMOCs were not addressed in the HMDP published in December 1971, nor in the preliminary draft of this plan. Appendix G is therefore provided, as a supplement to the original HMDP, in support of the discussion on these HMOCs which follow in this chapter.

PHYSICIANS(1)

A key member of the health care team is the physician. By reason of their lengthy and rigorous preparation, extensive medical knowledge, and in many instances ultimate responsibility for patient care, physicians play a significant role in setting the goals, tone and context of most aspects of medical service delivery.

To properly address the question of higher education's responsibilities in this HMOC, would require a document of considerable density, sophistication and extraordinary length. It would have to examine the entire fabric of medical care in terms of quality, priorities, future directions and organization, and only then relate its findings intimately to the physician's training process. To guide all aspects of planning in the medical education process, moreover, calls for an ability to reach definitive conclusions and enforce decisions that transcends this State and current consensus in the field. A study of such holistic dimensions lies far outside our capabilities. In future years, however, it is anticipated that the CMDNJ will provide the analyses and leadership for more fundamental planning initiatives.

Our present discussion will therefore confine itself to modest analyses and guidepost type recommendations, designed to build incrementally upon the current situation, strengths and possibilities of New Jersey's medical education system. Special attention will be paid to the manpower forecasts of the HMDP and their implications for the expansion of this system. The activity emphases advocated for our medical schools will be discussed, consequently, with respect to their contribution to closing the forecasted gap in the availability of physicians, in addition to their inherent validity. For this reason, we shall move immediately to a review of the quantitative issues resulting from the HMDP study.

A. MANPOWER NEEDS: present and future

In the HMDP, two alternative projections were constructed for physicians, differing in their forecasts of the magnitude of future supply.(2) In the first, the growth in physician supply was calculated by assuming a net percentage increase consistent with that apparent in recent years. The second projection is based on a fixed numerical increase derived from licensure data. Compared to the first approach, it predicts a larger supply in 1975 but then a lower supply level by 1985.

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(1) In our use of this terminology we refer only to M.D.s, not dentists, who will be treated in a separate section of this chapter.

(2) Appendix E, pp. 99-115; see also section 4 of the HMDP, Tables 10 and 12, pp. 72 and 85.

The built-in problem with the first approach is that as the base figure increases, the percentage increment constantly increases numerically, thus leading to a possibly inflated future supply estimate if projected over a long time period. On the other hand, it is obvious that the fixed numerical increment of the second approach leads to a smaller percentage increase each succeeding year.

While this second projection approach is thus more conservative, it is believed to be more reflective of the probable new physician output of the nation's medical schools. We are, in fact, assuming that the phenomenal upsurge in medical school spaces in recent years is not likely to continue at the same pace.(3) The second approach, based on the more moderate licensure-based projections, therefore has been selected for this presentation.

The latter figures from the HMDP have been graphed on a statewide basis in recognition of the fact that physician education in New Jersey is the responsibility of a single institution, the CMDNJ (albeit it presently operates two medical schools), and planning for future physician production should be conducted by that institution's taking cognizance of total State needs.

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(3) In 1930 there were 76 medical schools in the U.S. enrolling 6,456 first year students. Thirty years later, there were 86 schools enrolling 8,298 such students, a rise of 28.5 percent or just under one percent a year. By 1970 there were 102 schools with 11,348 first year students, while in 1972 114 schools are planned to be in operation with 13,000 such students. Since 1960, therefore, freshman spaces will increase by 56.7 percent or more than 4.7 percent a year. (Because the attrition rate in medical school is extremely low and diminishing at that, these first year enrollment figures essentially reflect the situation regarding the trend in graduates.) Although achievement of the goal of 15,000 medical school entrants by 1975 set by the Carnegie Commission on Higher Education, "Higher Education and the Nation's Health: Policies for Medical and Dental Education," New York, McGraw-Hill, 1970, p. 42, would constitute an increase over 1972 of 5.1 percent a year, it is not certain that target will be met, and even more uncertain whether federal, state and private funding levels will be sufficient to sustain this pace in subsequent years. The figures in this footnote were derived from Datagram, Table 1, p. 1005, Journal of Medical Education, November 1971.

As will be seen from Graph 1 on the following page, there is a highly significant divergence between the supply and reasonable demand curves. Even with the addition of planned expanded outputs of physicians by the CMDNJ in 1977 and 1980,(4) the future demand is overwhelmingly greater than the supply. The inset table on the graph further indicates the magnitude of this disparity by adjusting the need gap by a 50 percent "in-state survival" factor to replace those who, even if they also were graduated from New Jersey schools, would not be expected to practice here.(5) A program stategy line, which would meet the reasonable demand line every five years, is clearly beyond our realistic capabilities even without taking into consideration any requirement to compensate for the "in-state survival" factor.

To make possible the increments in physician output projected for 1977 and 1980 will require a capital expenditure in excess of $200 million. Current yearly operating cost per medical student in New Jersey is approximately $22,000. While

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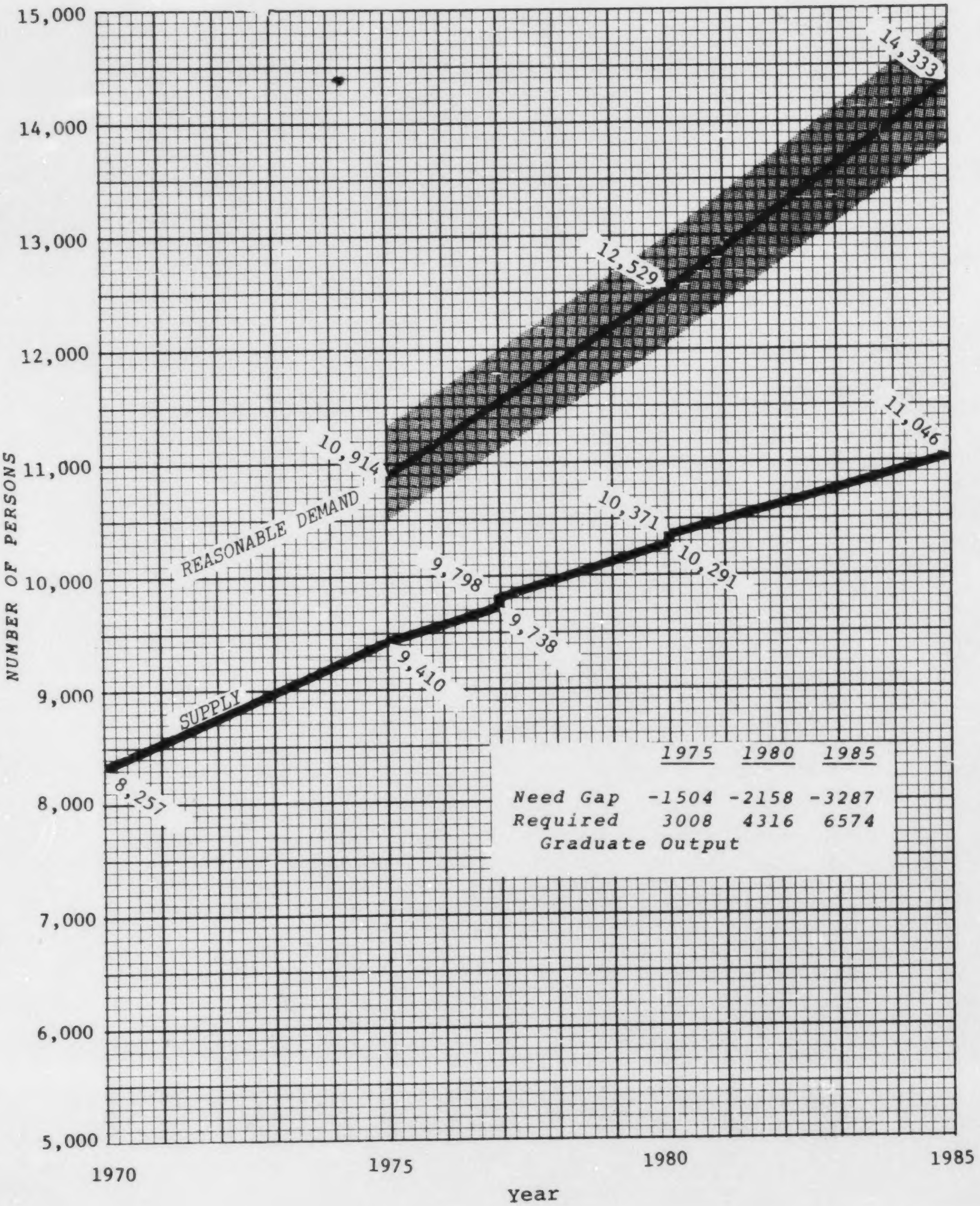
(4) The incremental increases in anticipated M.D. graduates from the CMDNJ in 1977 and 1980 are, respectively, 120 and 160. Only half those additions are plotted on the supply line in Graph 1, however, because of the 50 percent "in-state survival" factor. By 1980 the total number of M.D. graduates from the N. J. Medical School in Newark should rise to 200, as compared with a 1970 total of 80; by that same year the Rutgers Medical School in Piscataway should be graduating 160 M.D.s, whereas in 1970, as a two year school, it granted no M.D. degrees. For the CMDNJ as a whole, therefore, the 1970 to 1980 increase from 80 to 360 would represent a 450 percent rise in the production of M.D.s in the State.

(5) As indicated in the methodological discussion at the beginning of this chapter, we lack data to substantiate the 50 percent "in-state survival" factor for New Jersey. Data for Illinois, however, would indicate the percentage we have selected could be optimistic. In 1965, whereas medical schools in that state conferred 507 M.D. degrees, only 211 doctors of that number took out new licenses in Illinois the following year. The HMDP analysis, of course, has confirmed what common sense has indicated, that New Jersey is a substantial net importer of physicians, and presumably offers attractions which could justify the assumption that we can hold onto at least 50 percent of our graduates in this category. The Illinois figures are cited in a study directed by Dr. James A. Campbell, "Education in the Health Fields for State of Illinois", Vol. 1, Illinois Board of Higher Education, June 1968, p. 25

MANPOWER GAP: GRAPH #1

HMOC: Physicians

Statewide Basis



anticipated economies of scale should lower that figure, qualitative improvements and inflationary factors will work the other way to some degree. A conservative rough estimate of $80,000 operating expense in a standard 4-year curriculum for the education of each additional physician is not unrealistic. Thus to produce 1,000 more physicians per year would require a $20 million increase in the annual operating budget of the CMDNJ, without taking account of capital needs and related debt service. Our perception of these data therefore leads to recommendations in three major categories:

-those aimed at increasing the numbers of physicians to be educated in New Jersey institutions;

-those whose consequences could increase the proportion of our medical school graduates who will ultimately establish their practices in this State;

-those related to efforts to diminish the demand for physicians.

1. Increasing Physician Output

Adding to the number of physicians educated in New Jersey is not a task of simply increasing the number of students enrolled in our medical schools. As with all such institutions, the responsibilities of the CMDNJ are triple faceted. While its primary role is training doctors and dentists, it likewise is substantially engaged in research activities and the delivery of patient and other community services. Indeed, the educational process itself demands engagement in the two latter activities if physician graduates are to be well prepared for their future roles in society. Properly conducted, all three aspects of a medical school's activity are costly. As will have been clear from the previous brief resume of the financial resources required for medical education, this is by far the most expensive educational process extant. Expansion of our medical education capacity must be tempered by the Department's responsibility for the growth of other aspects of our higher education system, as well as other competing needs of society.

a. Establishing a Third Medical School in Southern New Jersey

For the above reason, our recommendations for increasing physician output in New Jersey will not attempt to fully close the need gap shown on Graph 1. Other initiatives to be discussed subsequently, also will be advocated to help reduce that disparity. At the same time, we do believe New Jersey should and can undertake to increase the supply of physicians educated in the State, particularly in consequence of the well recognized positive effects upon the quality of medical service resulting from the establishment of a medical school in an area, and its interaction with local health facilities and professionals. Moreover, New Jersey should cease being a "debtor" state which offers so few of its citizens seeking medical education the opportunity to pursue such a career, and fails to contribute "a fair share" to the national physician pool.

Chapter VI of this Master Plan has outlined the four areas into which the state has been divided by the New Jersey Comprehensive Health Planning Agency for purposes of planning of health facilities and service. There are presently campuses of CMDNJ in two of the four areas: The New Jersey Medical School (NJMS) is in Area 2 and The Rutgers Medical School (RMS) in Area 3. The location of the third medical school in Area 4 would seem to be a logical choice in order to meet the increased demand for physicians and allied health personnel.

In addition, the different campuses of the CMDNJ will be focusing on various facets of medicine, with the Newark Campus (NJMS) concentrating on urban medicine and the Piscataway Campus (RMS) concentrating on suburban medicine. The Camden, South Jersey campus would add to this system an ambulatory care-rural oriented educational experience to complement existing facilities and complete the Statewide System.

A recent analysis by the Department of Health using December 1970 data indicates that while the overall New Jersey physician-to-population ratio is identical to that of the national average (125:100,000), that of the southern region (Area 3) is 94:100,000, with each of the seven counties except Atlantic far under the national and New Jersey average.(6)

We therefore recommend that:

Recommendation #1 - The CMDNJ is strongly encouraged to pursue vigorously its present explorations for the establishment of a third medical school in the southern portion of the State. This facility should plan to graduate, if possible, an additional 160-200 physicians per year once fully operational.

The CMDNJ President, Dr. Stanley S. Bergen, Jr., has indicated that the type of institution which could be created in southern New Jersey might be characterized as a "medical school without walls". Essentially, he affirms that it is possible to provide medical education:

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(6) We acknowledge that practitioner-to-population figures are the crudest kind of indication of need; nevertheless it does provide a method of comparing supply in an HMOC within the state.

> "by making maximum use of existing facilities with a minimum of new construction. For the basic science component of medical education, there are a number of ways in which a school without walls might function. In the first place, use might be made of existing facilities in neighboring (collegiate) institutions... Second, students entering the third medical school might complete their basic sciences training at the New Jersey Medical School in Newark or the Rutgers Medical School in Piscataway and then continue for the remainder of their education at the (new) medical school location... Third, simplified, modular construction might be employed to build classroom and laboratory spaces on land adjoining a Veteran's Administration Hospital. For the clinical years, students would utilize existing hospitals throughout Southern New Jersey for their primary and advanced clinical clerkships".(7)

b. Expanding Clinical Teaching Capacity and Feeder Mechanisms

The Department is in whole hearted concurrence with these sentiments. Indeed, in addition to the applicability of the "medical school without walls" concept to the proposed new facility, we advocate that any further expansion beyond present plans of the two existent schools or the CMDNJ in general, give prior consideration to following this same approach. It is recommended that:

Recommendation #2 - Long range expansion of the productive capacity of New Jersey's medical education system warrants investigation into the development of alternative mechanisms including the utilization of basic science facilities and faculties that exist outside the existing medical education centers, as well as the optimal use and expansion of clinical teaching capacity at community hospitals and health service centers throughout the State.

c. Shortening the M.D. Preparatory Process

Still a third approach should be thoroughly explored in the search to increase the capacity of our medical education process and thereby its production of physicians: namely the adoption of programs that allow students to earn the M.D. degree in less than the traditional twelve years. We are fully aware that such initiatives are meeting increasing resistance from some medical school administrators and faculty, and are sympathetic to the warnings sounded in a recent spate of articles regarding the potential harm of an unexamined speed-up in the complex medical education curriculum. There is evidence that medical students, when given an option between four-year and three-year curricula, in medical school itself, overwhelmingly elect the longer programs.

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(7) Letter of December 29, 1971 from Dr. Stanley S. Bergen, Jr. to Donald E. Johnson, Administrator, Veteran's Administration.

The protests of medical educators that, in any case, curricula should not be uniformly prescribed for all students, are in fact well taken. Imaginative, flexible time requirements would, moreover, permit the increasingly disparate student bodies of our medical schools the necessary opportunity to proceed at paces more appropriate to their particular abilities, qualifications and professional goals. There is no more magic in a three year process than in four, and even a longer time frame may be appropriate and necessary to realize the expanded enrollment of disadvantaged students discussed in Chapter IV.

Other medical educators have expressed concern that movement toward the accelerated medical school curriculum has been accompanied by discussion and implementation of a complementary foreshortening of the pre-medical baccalaureate process as well as the elimination of the post-medical school internship. It is this sudden trend toward reduction of so many aspects of a doctor's educational process that would appear to rightly disturb even non-tradition bound educators in the field.

Nevertheless, a recent survey by the Association of American Medical Colleges(8) indicates that some 35 medical schools presently offer programs less than four years in duration. While many achieve this through substantive changes in the curriculum or by an actual reduction in the material required for student mastery, others have simply compressed the four year curriculum into three calendar years through the elimination of vacation periods. Pressures to adopt such procedures range from recent federal legislation that grants fiscal premiums to medical schools shortening their programs, to national organizations such as the Carnegie Commission on Higher Education which at the beginning of the decade recommended that all medical schools shift to three year programs by 1973-74 as one means of increasing the nation's physician supply.

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(8) Cited in a recent summary of the situation, "Medical Degree in Three Years Gaining Ground", by Edward R. Weidlein, Chronicle of Higher Education, March 27, 1972

Opponents of a speed-up correctly argue that even if all medical schools graduated their students a year earlier, the nation would benefit from only a one-time increase of approximately 10,000 doctors. On the other hand, it also must be acknowledged that compressing a four year curriculum into three calendar years could increase by one-third the continuing productive capacity of a given educational plant (provided additional clinical beds were furnished as well).

Complementary support, and a possible approach to the more rapid production of physicians, is advanced by Dr. Edmund D. Pellegrino.(9) Calling for a system of "specialty tracking", Dr. Pellegrino also suggests a nine-year course of medical study in which the M.D.'s current four years of baccalaureate education, four years of medical school, and four years of specialty training would be reduced to three years for each step. Rejecting the possibility of preparing physicians today "ready for any eventuality", Dr. Pellegrino believes "it is time to streamline the M.D. degree according to the purpose for which it will be used".

He proposes awarding the M.D. degree for specific "tracks" or specialties, and offers such suggestive areas as: family practice or primary medicine; the special fields of dermatology, cardiology, psychiatry, etc; a specialty in teaching or medical research; the preparation of university physicians who would combine medicine with sociology, anthropology or economics.

The student would select his specialty area for further study after 1 1/2 years of medical school, and start down that educational track. He advocates, however, that provision be made to permit students to change tracks during the course of their educational careers. It should be noted that Dr. Pellegrino's remarks extend a line of reasoning which has been extant for several years.(10) This plan makes no judgment regarding the propriety of any of these specialty "track" approaches, raising the issue at this time solely in the context of its possible contribution to reducing the time span required in the education of physicians.

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(9) Dr. Pellegrino, Vice President for the Health Sciences, SUNY at Stony Brook, outlined these views last December in Baltimore to the Legislative Advisory Council, Southern Regional Education Board. They are reproduced in Regional Action, Vol. 23 No. 1, Jan. 1972, SREB.

(10) For example, "Medical Education for Social Responsibility", Dr. Daniel H. Funkenstein, The New Physician, September 1969.

Even this cursory review, however, indicates that there are a series of pros and cons, and a variety of alternative approaches to the shortening of the M.D. preparatory process. Any final decision to move in that direction should properly be left to the judgment of the faculties and administration of the CMDNJ. Nevertheless, it is our recommendation that:

Recommendation #3 - The CMDNJ should complete current studies on the feasibility and appropriateness of initiating a shortened and/or consolidated medical school curriculum. In this context, possibilities for reducing the total academic sequence in the preparation of M.D.'s should be explored with other institutions in the State. Consideration also should be given in these studies to the desirability of combining a foreshortened curriculum with the creation of specialty "tracks" for medical students pursuing a variety of career goals.

With respect to the above recommendation the advantages of offering a shorter educational program for those students interested and capable of pursuing such an accelerated curriculum, while maintaining a more traditional academic cycle at one or more of the constituent CMDNJ medical schools, likewise should be considered. All such studies should also include analyses of the consequences for present internship and/or residency opportunities.

d. Fostering the Entry of Graduates of Foreign Medical Schools

The CMDNJ in September, 1972, initiated a so-called "fifth channel in New Jersey" program to speed up the return to U.S. medicine of American students who have completed their medical educations abroad. At eight cooperating hospitals, CMDNJ faculty supervise a clinical education process of nine months' duration for some 25 foreign medical school graduates (FMG's), prior to their eligibility for assumption of approved internships and residencies in New Jersey hospitals. The program is one of the first in the nation of its type.

The Department welcomes the program because it will shorten significantly the period of time previously required before FMG's could assume intern duties. Graduates of the program can be admitted to AMA recognized internship and residency programs, and subsequently be eligible for specialty board certification. Finally, the program provides necessary safeguards in insuring that hospital house staff positions will be filled only by persons whom qualified authorities can assure will meet the standards required for the assumption of such key positions in the delivery of patient care. At the present time, no other mechanism to facilitate the return of FMG's to U.S. medical practice, so equitably meets all of these criteria.

The Department's enthusiasm for the CMDNJ "fifth channel in New Jersey" program is closely related to our belief that FMGs will continue to provide some portion of the physician manpower pool in the United States for many years to come. Indeed, in view of the forecasted manpower gap shown in the previous graph, New Jersey must realistically continue to look to that source of supply to help meet its physician needs, particularly to the approximately 3,000 U.S. citizens, many of them from New Jersey, presently studying medicine abroad. Many of them are acknowledged as having been highly qualified for admission to American medical schools, had sufficient spaces been available.(11)

We consequently recommend that:

Recommendation #4 - The so-called "fifth channel in New Jersey" supervised clerkship program for foreign medical graduates, which has been launched by the CMDNJ in academic year 1972-73, should be continuously evaluated and serious consideration given to its continuation and expansion in subsequent years to alleviate the current physician shortage in New Jersey. The program should provide a supplementary, intensive, high-quality educational experience geared specifically to eliminating deficiencies in the previous clinical training of FMGs. The program should enable its participants to proceed directly into the mainstream of U.S. medical practice.

2. Encouraging Physicians to Practice in New Jersey

We have only one recommendation to advance under this heading, and it relates to that aspect of physician preparation technically referred to as graduate medical education, but more usually known as internship and residency programs.

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(11) The question of the non-citizen FMG is essentially not addressed here. The issue is fraught with ambiguities, both qualitative and moral. Not the least of the problems raised is the continued drain by an advanced society like our own, of thousands of doctors from underdeveloped nations like the Philippines, India and South Korea. Arguments raised in behalf of the practice, i.e., that alien FMG's might profit from the experience of some graduate training in the United States in order to provide better care subsequently for their fellow citizens, do not appear substantiated. All too often, John S. Millis points out, such an FMG "returns from his American experience with skills, aspirations, and attitudes completely incongruent with the actualities of the state of medical care in a developing nation." The problem of the non-citizen FMG is well-discussed by Dr. Millis in: "The Foreign Medical Graduate: Problem and Opportunity," in the Journal of Medical Education, Vol. 46, p. 312-316.

Without any question, there are facets to this process which are at least as significant as that related to increasing the supply of physicians in the State. Many of these issues are addressed in the paper that follows. It was prepared recently by the CMDNJ president, Dr. Stanley S. Bergen, Jr., as the basis for further activity in this area, and is incorporated here, with some minor adaptations, with his permission:

GRADUATE MEDICAL EDUCATION IN NEW JERSEY

INTRODUCTION

The State of New Jersey is facing a critical problem that is seriously affecting its ability to assure the highest quality health care for its citizens. The State does not now have enough graduate educational programs in the form of Interns and Residencies. Furthermore, many of those programs that do operate in the State do not have the type of academic affiliations that are needed to attract high quality attending specialists as clinical teaching staff, with the result that these programs find it difficult if not impossible to attract American trained graduates to fill the positions that are offered.

This problem affects the quality of staff, the quality of care at the hospitals and has a vital impact on the ability of the State to retain adequate numbers of physicians and dentists to meet the needs of its people.

The purpose of this paper is to outline in detail the problem that we face and to suggest steps that might be taken to deal with it.

BENEFIT OF ADEQUATE HOUSE STAFF PROGRAMS

It has long been recognized that graduate educational programs represented by Internships and Residencies generate numerous benefits for the hospitals in which they operate, for the communities that these hospitals serve, and for the State as a whole. The number and quality of such programs have a direct affect on the supply of physician manpower available to the State due to the fact that approximately two thirds of all physicians practice in the communities where they have received their graduate Internship and Residency training.

Graduate educational programs also have a direct impact on the quality of care available in the hospitals where they operate. Such programs are a great stimulus to the practicing physician in that they provide him an opportunity to participate in the education of the junior or "new members" of the profession. Such opportunities not only stimulate the professional in his desire to keep current, but force him to remain "one step ahead of his students". Many of our practicing physicians welcome the opportunity for this exchange of ideas and concepts with the newer professionals joining their ranks. Furthermore, the presence of such training programs tends to attract to the State quality physicians and specialists who are eager to be involved in programs combining delivery of health services with the teaching environment.

Finally, the activities of House Staff in the hospital setting provide essential continuity of care and assure the individual patient of the availability of round the clock physician coverage regardless of whether that patient was admitted by his private physician or is under the direct management of senior House Staff officers.

Thus graduate educational programs in the form of Internships and Residencies located at hospitals throughout the State are an essential ingredient both of assuring that the State and its local communities will have sufficient numbers of physicians to meet their health care needs and at the same time in providing added stimulus for continuing improvement in the quality of patient care rendered in our hospitals.

THE CURRENT SITUATION

Unfortunately, in the past, the lack of significant basic medical educational commitments within the State have sorely detracted from the ability of our hospitals to attract top flight American graduates to their Internship and Residency Programs. As of the fall of 1970, hospitals in the State of New Jersey offered 509 Internships and 972 Residencies. However, only 10.6% of the Internships were filled by students graduating from American medical schools and only 17.5% of the Residencies were filled by American graduates. 58% of the Internships and 62% of the Residencies were filled by graduates of foreign medical schools and 31% of the Internships and 20% of the Residencies remained unfilled.

This situation creates many difficulties for both our hospitals and for the State as a whole. One result is that the number of physicians completing graduate programs who remain in New Jersey to practice medicine and dentistry is at an unacceptably low level. For the most part, it is reasonable to expect that only the American graduates will remain to practice where they have received graduate training. Many foreign nationals are required by either law or by moral commitment to return to their country of orgin. Those foreign physicians remaining in the United States and in New Jersey under immigration quotas often find it difficult to assimilate themselves into the main stream of medical practice and to be accepted by the general patient population.

A second result is that hospitals unable to fill their Internship and Residency positions or hospitals that fill them with foreign nationals with cultural and language barriers often encounter severe difficulties in providing adequate House Staff coverage and must develop other mechanisms to assure adequate patient care.

Clearly, therefore, it is essential that a program be developed and implemented to increase the number of graduate educational opportunities offered by the hospitals of the State of New Jersey and at the same time to assure that a significantly larger number of these positions are filled by American trained graduates.

PLAN FOR THE FUTURE

A. Sources of Candidates for Graduate Education Programs

A primary source of candidates for graduate educational opportunities offered by hospitals in the State of New Jersey is and will continue to be the College of Medicine and Dentistry of New Jersey. At the present time the medical schools of the College are graduating approximately 80 physicians per year. By 1977 the number of graduates is expected to rise to approximately 200 physicians per year. Hopefully by the end of the decade each medical school will be admitting between 160 and 200 candidates for an anticipated M.D. graduate total of some 360.

The medical school is acutely aware of its responsibility to assure that as many of its graduates as possible undertake graduate training programs within the State and hopefully remain here to practice their profession. Initially our medical school graduates will be attracted to the base hospitals of the medical schools. Following this they will be attracted to our major affiliates and subsequently to our minor affiliates and other hospitals within the State. However, it is quite clear that even in the projected future, the number of graduates at the College of Medicine and Dentistry of New Jersey will be insufficient to fill the number of Intern positions presently being offered by the hospitals within the State. Clearly, therefore, vigorous action will be required if we are to attract out of State candidates to pursue their graduate education at hospitals within the State of New Jersey.

B. Need for Action

As the primary medical education institution in the State of New Jersey, the College of Medicine and Dentistry recognizes its responsibility to join with other State agencies, voluntary and private institutions, and all other interested groups to develop and implement a program designed to successfully recruit American trained candidates for the graduate education opportunities offered by the hospitals in the State of New Jersey.

It is becoming more and more evident that in the future the trend will be towards closer ties between centers of medical education and graduate training programs in local hospitals. The Council of Medical Education of the American Medical Association has already indicated that all free standing Internships will be phased out by 1975. This will mean that all hospitals within the State of New Jersey providing AMA Approved Internships will also be required to establish Residency Programs thus assuring a continuum in the student's educational process.

At the same time there has been some indication from the Council that within the next few years requirements will be developed that all Residency training programs come under the aegis of an Academic Medical Center. In the State of New Jersey this responsibility would clearly fall to the College of Medicine and Dentistry. These could be organized as affiliation agreements, or could be joint Residency programs with individuals rotating through a number of participating hospitals, including but not limited to the university or base hospital of the medical school.

In addition to the requirements of various national accreditation bodies, it is clear that the medical school has numerous resources which it can and will make available to assist New Jersey hospitals to upgrade and enlarge their graduate training programs and in many cases to bring these programs closer to the main stream of medical education.

C. Plan for Action

The College of Medicine and Dentistry of New Jersey proposes that it act to establish a Task Force that would include, but not be limited to the New Jersey Hospital Association, the Medical Society of New Jersey, the State of New Jersey Department of Health, the State of New Jersey Department of Higher Education, the New Jersey Dental Society, the New Jersey Association of Osteopathic Physicians, the Academy of Medicine of New Jersey, the Regional Medical Program, the Directors of Medical Education in hospitals throughout the State and others who might be vitally interested in the matter of graduate education programs. The purpose of this Task Force would be to develop a model for the enlargening and strengthening of graduate educational programs throughout the State. Specifically the Task Force would concern itself with:

1. The Proper Utilization of the Resources of the College of Medicine and Dentistry to further Graduate Education in the State

The College represents not only a pool of skilled specialists who are deeply involved in both Under-Graduate medical and Graduate training programs for dentists and physicians, but also a potential for recruitment of highly skilled teachers who will be essential to the development of effective graduate educational programs. Great care must be taken to see that the available resources of the College are effectively integrated into the State-wide model.

2. Health Professions Education Consortia

In developing the State-wide model the Task Force will have to pay particular attention to the location and role of health professions education consortia in providing both under-graduate and graduate educational programs for students, interns and residents. They will also serve as the regional focal point for graduate educational programs undertaken by community hospitals in surrounding areas.

3. Role of Community Hospital

> Finally the Task Force should be concerned with integrating the graduate educational programs of local community hospitals into the State-wide model in such a way as to allow them to take full advantage of the academic and other resources available to them through the College and through their local area health education center.

The many significances of the above discussion by Dr. Bergen are clearly apparent, and merit our full support. With specific reference to the initially defined thrust of this section on physicians, regarding ways to close the manpower gap, we call attention to the statistic cited that two-thirds of such personnel practice in the communities in which they received their intern/residency training. Recall that for planning purposes we have found it not unjustified to normally expect that only fifty percent of our medical school graduates will stay to practice in the State. Attainment of the additional seventeen percent retention rate cited by Dr. Bergen, would indeed constitute an important source of further physician manpower.

For all of the benefits described by Dr. Bergen in the previously quoted section, we therefore recommend that:

Recommendation #5 - The CMDNJ should continue participating in the recently implemented Task Force composed of governmental agency, professional society, and hospital medical education representatives to address the problem of improving graduate medical education programs in the State. The consequences of these efforts should be to attract more American trained physicians to perform their internship and residency training, and hopefully establish their subsequent practices, in New Jersey, while simultaneously contributing to raising the standards and levels of care available in our hospital facilities. The Task Force should address the question of costs of such training, appropriate financing mechanisms, the need for physician specializations in the State, and the delineation of appropriate clinical resources to support the required programs. The Department of Higher Education is committed to the support of such activities.

3. Diminishing the Demand for Physicians

A multiplicity of factors influence the number of physicians required in a given area to provide the necessary quality and quantity of medical care. We shall address just one of these, namely the provision of more and better help to either make it possible for the physician to see more patients, or unnecessary that he see certain persons at all.

In other words, in addition to the production, attraction, and retention of more doctors, we must train new health manpower specialists, or deploy and extend the duties of present personnel in ways in which, as part of a more fully integrated system of health care, they can assume a meaningful portion of the assignments now reserved to the physician alone.

"There is virtually no M.D. function that cannot be delegated to another health profession under the appropriate circumstances," according to Dr. Pellegrino(12). Among the necessary conditions he would establish for delegation of these functions are:

1. Identify the specific task -- decide what is needed, what is done to satisfy that medical need and what a person must know to perform that task, then program an individual to perform that function, making sure that he has access to the physician and other necessary members of a health team when it is required.

2. Recognize that the "allied health personnel" should perform the task under direct or indirect supervision of the physician working in a total "system" of health care.

3. Establish a complete system of medical care through which both the physicians and allied health personnel work in delivery of care regardless of distance. Communication and transportation links are vitally important to such a system.

4. Create an open-ended system which would allow the physician's assistant or other allied health personnel to "move up the ladder" if he wishes and is able to do so.

In short, what Dr. Pellegrino and many others are urging is that:

Recommendation #6 - All appropriate mechanisms should be employed to insure that physician education and utilization are consonant with societal needs. These mechanisms include: (a) insuring that as appropriate levels of medical judgment in health care delivery are defined, curriculum and training should be geared to those needs to prevent needless overeducation; (b) preparation of auxiliary personnel to perform largely diagnostic and/or therapeutic tasks not requiring medical judgment; and (c) as part of the team concept of medical education, student physicians should be made aware of appropriate ways to work with other members of the health care team to insure their optimum utilization as well.

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(12). Op. Cit.

The occupational areas of nurse clinicians and physician's assistants, both highly significant with respect to the above recommendation, will be discussed at length in later sections of this chapter. Physicians can be advised as to how best to work with such emerging as well as traditional members of the health care team.

B. OTHER CONSIDERATIONS: An Agenda for Further Study

As noted previously we do not feel equipped in this first attempt at master planning for the health professions to adequately address many of the issues important to physician education. The introduction to this study asserted, however, our intention to update and extend the scope of the plan in future years. Moreover, some of these issues have been addressed in the many recommendations dealing with investigation, demonstration and evaluation of new concepts, as well as in the chapter on Research. We do provide an agenda of considerations for incorporation in our future master planning activity; verification of their validity, necessary improvements in their comprehensiveness, and assistance in the presentation of related authoritative analyses, will be sought from the health professions community and in particular the CMDNJ:

1. Improvements in the Delivery of Health Care Services

Analysis and experimentation seem needed to improve the organization of our medical service delivery system. Our medical schools might consider developing models of health care delivery which could be applicable to other health providers in the State. Such models could incorporate linkages between levels of care and health insurance programs, show ways to provide quality care to people of all economic strata, demonstrate the efficient and effective use of all members of the health care team, and illustrate ways for reducing medical costs to society. Demonstration models of promising approaches such as ambulatory care centers, group practice plans, health maintenance organizations, use of contemporary technological innovations such as closed-circuit television links, automation and computers, probably should be available to our physicians of the future during their formative years. Research emphasis in the health professions schools, it would follow, should be directed to give especial attention to these issues. Feedback from comparative studies of alternative health care delivery modes will surely be required. Interdisciplinary groups involving university management, economics, sociology, engineering and other disciplines should be joined in such efforts with medical faculties.

2. Solving Physician Maldistribution Problems

Although generally acknowledged that a major aspect of the physician shortage problem is actually one of their unequal distribution in rural and inner-city areas, adequate solutions are still lacking despite a variety of efforts. The use of financial incentives through assistance and subsequent forgiveness of all or portions of the cost of medical education, for physicians practicing in such areas, has been advanced. Giving priority to medical school graduate level (intern and residency) affiliations with hospitals in urban or rural areas experiencing physician shortages and health care deficiencies, is another idea. Still a third is the organization of a government medical service which would assign physicians to such regions. Finally, the establishment of group practices, including health maintenance organizations, perhaps under a medical school's aegis to lend prestige, maintain a high level of professional stimulation, and insure quality, has been advanced as a means of attracting physicians to those areas where they might otherwise be reluctant to practice alone. Controlled experimentation along these lines would appear indicated.

3. Continuing Physician Education

The recent formation of an Office of Continuing Medical Education by the CMDNJ is a harbinger of significant developments in this field. An expanded Advisory Council consisting of representatives of professional societies, hospital medical educators, and governmental agencies was formed in March 1972. Specific action plans are emerging, in which context consideration is being given to:

- -- Organizational, logistical and financial support problems;
- -- The focus and thrust of educational activities to assist practitioners to remain current not only with clinical and scientific advances, and the newer techniques of practice, but also with team work concepts with other health professionals, and developments in health delivery systems;
- -- The program's relationship to the question of relicensure of practitioners, and possibly peer and utilization review.

4. Organization of Clinical Medical Education

A unifying element throughout this plan is the team approach to health care delivery and professional education. It is based on the belief that a patient's care is better and more efficiently managed by a group of physicians, specialists, nurses and auxiliary personnel than by a lone practitioner. At the present time, nevertheless, there would appear to exist no opportunity in this nation where medical students can learn to function in such a patient care environment. If the team approach is to be truly encouraged, a reorganization of the clinical clerkship component of medical education in our teaching hospitals would seem to be required.

5. Emphasis on Primary Health Care

The recent affiliation of the CMDNJ-Rutgers Medical School with the Hunterdon Medical Center, one of the nation's outstanding exponents of primary or family medicine, is a meaningful affirmation of the sentiments expressed in 1970 by Governor Cahill in calling for the unification and redirection of medical education in New Jersey. An outstanding opportunity is now available to establish a special emphasis in the State's medical education system for the preparation of personnel for primary health care. Clarification of the theories and goals of primary medicine as they will be advanced by the CMDNJ, identification of the actual problems patients present to primary care personnel and their consequent responsibilities, and development of appropriate community settings for its delivery, constitute a challenging and exciting task for further elaboration.

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In the preceding discussion of physician education, it will be noted that we have rarely departed from recommendations which in some sense might be said to constitute truisms. They refer to matters well-known and long advocated by commentators within and outside the profession. Nevertheless, we do not accept that they are too obvious and unimportant to merit consideration in this plan. On the contrary, despite the broad support they usually enjoy, they remain to be actualized in many instances. Their vigorous implementation will help establish a proper base line for physician education activity in New Jersey, and place the State in a better position to cross new thresholds leading towards a truly qualitative and comprehensive system of the future.

PHYSICIAN'S ASSISTANTS

A. The Need

Most knowledgeable authorities agree that the supply of physicians is presently insufficient. Many also contend that even with increased medical school productivity, the supply of doctors will continue to be insufficient to provide adequate personal health services to an expanding population -- a population ever more demanding of a higher quality and intensity of health care.

This insufficiency of personnel is felt most strongly in rural and inner-urban areas. The poor and the medically indigent have higher rates of disability and death than the rest of the population, a fact which can at least in part be attributed to the lack of qualified medical personnel. Even in areas where there is no pressing shortage of physicians, practitioners find themselves excessively burdened with strictly technical responsibilities, such that their efficiency as clinicians suffers.

Administrative aspects of health insurance, Medicare, Medicaid, and liability problems have invaded the physician's time. Medical technology and research present new treatment modalities which must be learned and applied. Under these increasing pressures, physicians have engaged in group practices and have hired auxillary personnel to perform routine tasks in data collection.

Nevertheless, even in the context of group practice, patients seeking routine check-ups, or returning for routine follow-up treatment, continue to utilize a great deal of the physician's time. Proper delegation of these and other aspects of a physician's present duties would free him for attention to those matters which require the highest level of education, experience and judgment. The application of communications technology, especially image transmission, promises to help alleviate the problems of the physician shortage. Use of such techniques to extend the control and coverage of the physician, however, requires a properly trained assistant at the patient end of the communication line to transmit data and administer treatment.

Given these circumstances, the need for an assistant who can discharge some of the less judgmental and complex tasks of the physician, is manifest. Assistants to physicians ideally should be able to: 1) deliver aspects of primary health and inpatient hospital care; and 2) participate in preventative, outpatient, and extended care aspects of treatment. It is expected that the physician's care to patients will be greatly augmented. It is further anticipated that the increased income generated by such assistants can lessen, if not prevent, increases in the cost of physicians' services to patients.

For the Department of Higher Education efficient and logical use of health personnel is more than a tangential concern, particularly in the case of physicians whose preparatory program is by far the most costly training process within the Department's purview. The Department therefore encourages the development of physician's assistants as a strong and viable health personnel category, because of their profound implications for its manpower, service, education, and fiscal responsibilities.(1)

B. Types of Physician's Assistants

The functions of assistants to physicians must be established before the educational programs to prepare them for their responsibilities can be planned. Of paramount importance is the degree of independence from direct physician supervision accorded the assistant.

It is our belief that extremes are to be avoided. The physician's assistant should not be permitted to establish an independent practice, or to practice as second-rate doctors. There must be an overriding commitment to the quality of care and patient safety. On the other hand, it will be necessary to afford dignity and reasonable lateral and vertical career mobility to such health care personnel, and not reduce them to "indentured servants" forever bound to a particular physician.

A Three-Level Categorization of Physician's Assistants

The great variety of functions, skills, knowledge, and supervision required of different types of physician's assistants has resulted in several categorizations. These are generally defined by the assistants' ability and qualifications for making independent judgments, and by the procedures they are allowed to perform. We have found the classification of physician's assistants recommended by the National Academy of Sciences (NAS) generally compelling (2). The NAS recommends the creation of three categories of physician's assistants, herein referred to as Type A, Type B, and Type C.

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(1) The growing acceptance of this HMOC is reflected in the fact that at the end of FY 1972 more than $6 million in federal contracts and grants was awarded to universities, medical schools, and health care institutions in 26 states. These awards constitute only the first year of a new NIH Bureau of Health Manpower Education program to train physician's assistants for primary care. More than 1,400 students are currently enrolled in this program.

TYPE A

> "The Type A assistant is capable of approaching the patient collecting historical and physical data, organizing these data and presenting them in such a way that the physician can visualize the medical problem and determine appropriate diagnostic or therapeutic steps. He is also capable of assisting the physician by performing diagnostic and therapeutic procedures and coordinating the roles of other, more technical assistants. While he functions under the general supervision and responsibility of the physician, he might, under special circumstances and under defined rules, perform without the immediate surveillance of the physician. He is, thus, distinguished by this ability to integrate and interpret findings on the basis of general medical knowledge and to exercise a degree of independent judgment."

Typical duties of Type A assistants, for example, could include taking case histories, doing comprehensive physical examinations, and assisting the physician in the performance of certain procedures (e.g., gastric analyses, arterial punctures, lumbar punctures, pulmonary function studies, bone marrow biopsies, blood counts, urinalyses, administration and regulation of intravenous fluids, application and removal of casts, re-dress and evaluate postoperative incisions, and provide patient instruction in the areas of preventative health care and follow through on therapeutic programs.)

TYPE B

> "The Type B assistant, while not equipped with general knowledge and skills relative to the whole range of medical care, possesses exceptional skill in one clinical specialty or, more commonly, in certain procedures within such a specialty. . . . Because his knowledge and skill are limited to a particular specialty, he is less qualified for independent action."

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(2) Report to the Ad Hoc Panel on New Members of the Physician's Health Team of the Board of Medicine of the National Academy of Science, 1970.

Type B assistants are therefore viewed as specialists possessing highly technical skills. However, they lack the range of knowledge of general medicine that gives the Type A assistant the ability to integrate and interpret findings, and exercise a relatively high degree of independent judgment. They thus engage in simple procedures, perform specific tasks of a technical, but delimited nature. The feasibility and utility of Type B assistants has been illustrated in New York City and Colorado experiments, where such personnel are being used in specialized areas such as operating and delivery rooms to alleviate existing personnel shortages.

TYPE C

> "The Type C assistant is capable of performing a variety of tasks over the whole range of medical care under the supervision of a physician, although he does not possess the level of medical knowledge necessary to integrate and interpret findings. He is similar to a Type A assistant in the number of areas in which he can perform, but he cannot exercise the degree of independent synthesis and judgment of which Type A is capable."

The Type C assistant could function over a broad-range of practice, but only would perform simple tasks of a routine nature under the direct supervision of a physician.

C. Educational Curricula and Experience of Physician's Assistants

In addition to the categorization of types of assistants, the National Academy of Sciences also describes the curricular and prior experience considerations for each level, which requirements are likewise proposed for New Jersey:

TYPE A

> "This curriculum should include adequate instruction in the basic sciences underlying medical practice and sufficient exposure to clinical medicine to ensure understanding of patients, their ailments, and the diagnostic and therapeutic responses to those ailments. The Type A assistant will generally have four types of training: 1) basic general education; 2) basic scientific education; 3) general clinical training; 4) specialized clinical training in some aspect or aspects of medical practice."

The Type A assistant is envisioned by the NAS Panel as a high school graduate or an experienced Type B or Type C assistant who takes the equivalent of two additional years of professional-level training in classroom and clinical work. The emphasis in training is to be on the nature of disease processes and symptoms, recognition of abnormal physical findings and abnormal laboratory tests, and the consequences of drug actions and therapeutic procedures.

The Duke University preparatory curriculum, which is the oldest program in this field, may provide a model to be adapted for Type A programs in New Jersey. A possible defect in the Duke curriculum is the insufficient attention paid to general education, especially communication skills.

The first nine months at Duke are spent learning the basic medical sciences in a rigorous program of over 1,000 hours of formal academic education. Courses offered during these first nine months include pharmacology, biochemistry, anatomy, physiology, medical terminology, history, philosophy, and ethics of medicine, epidemiology, clinical medicine, radiology, patient evaluation, basic laboratory procedures, animal surgery, human growth and development, electrocardiography, microbiology, and chemistry.

The last fifteen months are spent in supervised clinical rotations. Required rotations include eight weeks in an outpatient clinic with alternate nights in the emergency room; an inpatient service of eight weeks supervised by the chief resident on the service; an outside rotation under a physician with an office and hospital practice; four weeks in an intensive care unit; and four weeks in a health clinic.

Time also is alloted for elective clinical rotations, permitting further experience in such fields as cardiology, chest diseases and allergy, endocrinology, gastroenterology, nephrology, neurology, ophthamology, pediatrics, plastic surgery, rheumatology, general surgery and urology. All the rotations, required and elective, feature weekly seminars supervised by faculty members.

In sum, the Type A assistant at Duke University receives a fairly thorough technical education. For this reason, the products of this educational process at Duke are referred to as Physician's Associates in recognition of their enhanced responsibilities and status. Although a baccalaureate degree is not considered essential, it is a preferred route, since the Type A assistant will require a broad information base and will be working closely with others with degree preparation at this level.

TYPE B

> "A significant portion of this training should be by physicians specializing in the area of the assistants' concentration... Because of the different nature of their activity, requiring less independence, the general education and clinical backgrounds of Type B assistants need not be as extensive as suggested for Type A above."

The Type B assistants are also high school graduates; their education focuses only on specialized clinical training and to a lesser extent basic scientific education. Since the Type B assistant will be doing specialized work in a narrow range of activity, the length and content of training will be variable and individually determined for each specialty. It would seem that the nurse clinician concept would sometimes be subsumed under the Type B assistant, although nurses also should be granted advanced standing in a Type A program, if they so desire.

While we strongly support the development of programs for nurse clinicians, as a form of physician's assistant, it is appropriate in this context to note that we do not believe nurses should be the sole recruitment source for physician's assistants. Experience has demonstrated that intelligent high school graduates can be trained to become competent physician's assistants within two years. If this continues to be borne out, then it is clearly less efficient to start with registered nurses who have already had at least two years of a different type of preparation. Furthermore, if nurses were to continue in short supply, one is better off in developing a new occupational category, with its own source of students. Finally, since the nursing profession in the United States is constituted mainly of women, to perpetuate such a skewing of gender in a new occupational category would be unwise.

TYPE C

> "Because they are non-specialized personnel, (they) require less general education, basic scientific education, clinical training, and special skill training than is necessary for Type A or Type B assistants. A larger portion of their training might be given outside a medical center, and much of their clinical training could be given on the job."

It is this level of physician's assistant whose characteristics are described by some as being most similar to products of the MEDEX programs conducted by the Universities of Washington and Alabama (in Birmingham). Those enrolled are former military medical corpsmen, trained to a level of independent performance. The program requires three months of additional didactic instruction and twelve months of preceptorship and/or clinical training under close physician supervision. It has been observed, however, that these programs are becoming less distinguishable in time from Type A preparatory programs. Indeed, it has been suggested that the Type C category as set forth by the NAS is better defined as an aide than an assistant and hence does not require collegiate-level preparation, but should continue to be trained on-the-job. Our own view at this time is to subscribe to the latter position.

D. Articulation of Programs (Career Mobility)

The structure of the physician's assistant programs implies and, indeed, demonstrates the possibilities for working articulation between the Type A, B, and C practitioners. Each can and should have career access to the next level, if he is able and so chooses. The Type A assistant should be given advanced credit if he wishes to pursue a degree in medicine (M.D.).

The modular course format, currently in use at Hostos Community College in New York City and at Duke University, allows for variations in the educational process without changing the overall objective. Knowledge is built step-by-step as the student passes each performance objective. Although most modules are six weeks in duration, the student may work at his own pace. Educational technology and audio-visual aids should be used to enhance learning.

E. Sponsoring Institutions

The College of Medicine and Dentistry of New Jersey is the most appropriate institution of higher education to coordinate the State's physician's assistant programs. Joint program sponsorship, wherein the CMDNJ shares the responsibility for organization and supervision with other institutions, which colleges should provide those segments of the programs related to general and basic science education, should be encouraged. In some instances, as in the preparation of specialized Type B physician's assistants, certain community hospitals will find it advantageous to affiliate with the CMDNJ.

The rationale for so charging the CMDNJ with this responsibility can be summarized as follows:

A. Its ability to attune the education of the assistant to that of the physician so they may function as a team;

B. Its intimate awareness of rapidly changing medical technology, health care advances and requirements;

C. Its superior qualifications for recruiting, evaluating the credentials, training and supervising the medical educators to staff the physician's assistant programs;

D. Its unique ability to develop and administer standards for the clinical component of the educational process.

The CMDNJ and other sponsoring hospitals or colleges, in supervising program design and administration, will be constrained to seek the counsel of professional medical organizations, as well as institutions involved in patient services, and agencies responsible for the quality of health practitioners. Indeed, the entire health care delivery system in New Jersey will undoubtedly play a role in the development of the physician's assistant concept in this State.

F. Program Accreditation

It should be anticipated that various agencies will seek involvement in the accreditation of these educational programs. For instance, the AMA's Council on Medical Education and the Association of American Medical Colleges today jointly accredit programs for the preparation of physicians; it would be appropriate if they established a similar review and approval procedure for physician's assistants. Meanwhile, the Federal government is developing a protocol to evaluate the effectiveness of physician's assistant programs, which likewise could assist in setting guidelines and maintaining national standards.

G. Credentialing Physician's Assistants

The new occupation, physician's assistant, must be integrated into the legal framework of health care delivery. The legal responsibilities of the assistant to patients and physicians must be set down, the scope of practice defined, standards for practice established, and qualifications to practice set forth. Although the Department of Higher Education has no jurisdiction in this area, the Legislature and appropriate State agencies must be encouraged to address this matter immediately to provide a framework for practice within which our educational programs can be constructed.

We will not attempt to analyze here the various alternative approaches which have been taken or proposed in various parts of the nation for credentialing physician's assistants. An authoritative and detailed summary of such approaches has been prepared by the Duke University Model Legislation Project for Physician's Assistants.

It is our belief that in credentialing physician's assistants however, the guiding philosophy should be the setting of standards which insure patient safety by guaranteeing the person's qualifications. Undue restrictions should not be placed on the scope of a physician's assistant's practice, through rigid definitions designed to protect the field of practice of other health professions. Some limitation on the scope of practice is justified with respect to highly complex fields where there is a need for specialized, long-term training outside the regular basic medical curriculum. But care should be taken not to so limit the physician's assistants' function as to undercut the manpower aid he offers to the health care delivery system. On the other hand, it is not recommended that physician's assistants be separately licensed, or permitted to establish independent practices.

H. Place in the Health Care Delivery System

The physician's assistant is not an intruder upon the domains of other health professionals, but rather an extension of the physician's practice who should deal only with tasks now performed by physicians.

The assistant should function as an integral member of the health care team, although his accountability should run to the physician only. Even within the hospital practice context, the emphasis should be on the physician-assistant relationship, not the hospital-assistant relationship. The report of the American Hospital Association and the Joint Commission of Hospital Accreditation, "The Utilization of Physician's Assistants in the Hospital", for example, recommends that appropriate hospital privileges be given to an assistant in any hospital where his physician-employer practices. The report would require only that the hospital director approve of the assistant's background, his education and training, and his proposed functions and limitations, as well as the measure of control by the physician. This analysis assumes, of course, that licensure procedures will be compatible with the use of assistants in a hospital and that professional liability coverage will be available.

I. Demand and Public Acceptance

1. Demand

It appears that there is a large potential demand for physician's assistants. A nationwide sample survey presented in the September 30, 1968 issue of Medical Economics reported that approximately fifty percent of the responding physicians would hire a trained assistant. While this survey and others like it carried out in more circumscribed regions indicate a high degree of physician interest, it is difficult at this time to accurately forecast future needs, since most New Jersey doctors as yet have little experience with the assistant's functions in a practice situation. Certainly, the techniques for health manpower forecasting described elsewhere in this study are regarded as invalid at this time for the physician's assistant category.

Surveys are needed to determine the demand for physician's assistants, which information can contribute to the establishment of licensure and educational program outlines. With such surveys as indicators, the nature and scope of future training programs for physician assistants will acquire further substance, particularly in light of the employment opportunities available to the graduates of the initial program(s) established under this plan.

2. Public Acceptance

To a great extent, employment possibilities will depend upon the acceptance of assistants by patients, coworkers, and physicians themselves. Physicians will undoubtedly seek legal clarification of their liability for the work of their assistants, although in other states this has not posed an insurmountable problem. Patient acceptance in areas where assistants are currently functioning has, to date, also been generally good.

Prior to designing the physician's assistants program, the sponsoring institution will need to seek the advice and involve physicians' groups, nursing associations, hospital employees' unions, and hospital organizations, as well as other allied health professions. Consumer groups must be included, and a public education program conducted stressing that the assistant represents a desirable, contemporary, and promising means of further extending the delivery of first-class medical care to the entire community.

In planning the public education program, consideration should be given to data showing that acceptance of physician's assistants, though generally good, is best among the better educated, the middle socio-economic groups, the younger and the better informed. Extra care has to be taken to see that the disadvantaged, the poorly educated, and the elderly members of society receive adequate information on the physician's assistants' role and functions.

J. Summary

The Department has followed the development of the idea of a Physician's Assistant since its rise to national prominence. The tone of this chapter indicates our support of the NAS guidelines regarding both classification and education. In view of the potential impact which we hope the development of the physician's assistant HMOC will bring, the Department makes the following recommendations:

Recommendation #1 - That a survey of physicians and hospitals be conducted by a broadly constituted HPEAC task force to determine the need for physician's assistants so that programs can be developed accordingly. The survey should identify the types of P.A. programs required, related to specific responsibilities and authorities to be delegated to such personnel. The task force should develop prerequisite guidelines for admission to P.A. programs related to educational background, and prior health service or biological experience, giving consideration to the need for alternative entry levels depending upon individual student qualifications, motivation and maturity. Finally, the task force should develop evaluation and performance criteria whereby New Jersey's P.A. programs and their graduates can be judged in relation to their contribution to health care delivery.

Recommendation #2 - That the HPEAC, with the assistance of the New Jersey Medical Society, the State Board of Medical Examiners, and the CMDNJ, investigate immediately the credentials situation and recommend appropriate regulatory procedures for physician's assistants in New Jersey. These procedures should be established at least concurrently with the initiation of physician's assistant programs in the State.

Recommendation #3 - That initially only a limited number of physician's assistant education programs be developed within the State and that all such programs be designed and offered in affiliation with the CMDNJ.

Recommendation #4 - The HPEAC should encourage appropriate organizations and institutions to engage in a broad program to educate the general public on the emerging role of physician's assistants in health care delivery.

PROFESSIONAL NURSES

Nursing occupies a prominent place among the health occupations, owing to the relatively large numbers of personnel involved and the importance of its role in the delivery of health services. The magnitude of professional nurse manpower in the delivery of health services is indicated in the maximum and minimum forecasts of demand for such personnel identified in the Department of Health's Health Manpower Data Project (Appendix D, Section 4, Tables 10 and 12). Fulfillment of present unmet needs, and the passage of maximum impact national health insurance, are therein shown to require by 1985 some 56,444 active professional nurses in New Jersey. In contrast, the next largest manpower pools are estimated as requiring substantially fewer personnel: licensed practical nurses -- 20,479; physicians -- 14,875; dentists -- 8,082; radiologic technologists -- 7,676; pharmacists -- 6,603.

Professional nursing also is being treated at greater length than most other HMOCs in this study because of the controversy and complexity surrounding the issues involved in nurse utilization and preparation. The field's future requirements demand careful scrutiny: of current patterns of nurse utilization; of forthcoming changes in the delivery of health services and the shifting roles of nurses; and of changes occurring in preparatory programs for nursing. While the Department of Higher Education is not charged with delivering health services and setting parameters of professional roles, it does have responsibility for guiding educational programs to prepare sufficient numbers of nurses with the requisite abilities to meet the changing health needs of the people of New Jersey.

Most of the factors discussed in the remainder of this section have been identified because of their implications for nurse education programs. We do not believe the majority of these factors can or need be translated into mathematical formulae that would affect the findings of the Department of Health's HMDP at this time. Two factors, however, do call for modification of the HMDP nurse supply and demand forecasts: the expanding role for nurses; and certain broad distinctions in nursing care levels of responsibility as they relate to current educational program levels. Both factors will be applied later in this section to the HMDP figures to create new bases for forecasting purposes.

BACKGROUND

There are currently two types of licensed nursing personnel in the state: professional nurses and practical nurses. Professional nurses are eligible to become registered (RN) upon graduation from a state-approved: 1) two-year, associate degree program; 2) usually a three-year, hospital diploma school of nursing program; or 3) a four-year baccalaureate program. The practical nurse also must attend a state-approved school, usually for one year, and upon graduation is eligible to take a licensing examination (LPN). Practical nurses are not prepared in programs within the purview of the Department of Higher Education and hence will not be analyzed in this plan except to the extent that their function and supply affect registered nurse utilization.

The New Jersey Board of Nursing defines professional nursing practice as:

> "The performance for compensation of any professional service requiring the application of principles of nursing based on biological, physical and social sciences, including responsible supervision of a patient requiring skill in observation of symptoms and reactions and accurate recording of the facts and carrying out of treatments and medications prescribed by a licensed physician, and the application of such nursing procedures as involved in the understanding of cause and effect in order to safeguard life and health of a patient and others."(1)

Registered nurses are employed today in a variety of settings. They function as independent practitioners, such as private duty nurses or consultants; they participate in organized nursing services in nursing homes, hospitals, public health agencies; they can also be found in the school system, in research, administration, schools of nursing, industry, doctors' offices, etc.

Historically, however, the nursing profession has been closely associated with the development of hospitals in the United States. As the need for trained personnel increased to care for the sick in these institutions, programs were initiated to prepare nurses in the hospital milieu. In the late 1800's, hospital, or diploma schools of nursing were established and the students in these schools were expected to provide patient care during their training period as well as after graduation. This afforded a ready supply of manpower to those hospitals with nursing schools. The schools of nursing also presented an occupational opportunity for women at a time when few fields were open to them. Hospital schools proliferated in the first part of the Twentieth

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(1) New Jersey Board of Nursing. Nurse Practice Act. Division of Consumer Affairs, Department of Law & Public Safety, 1967.

Century, producing a supply of nurses to meet hospital, as well as other health agency staffing needs.

After the Second World War, several important trends emerged which substantially affected the nursing profession: 1) gradual emancipation of the female accompanied by increased and diversified job opportunities; 2) the availability of higher education for greater numbers of people, especially women; 3) increasing sophistication of health care services and technology which created the need for more extensive educational programs in the health fields, as well as for specialization within health manpower categories.

Although the trend towards higher education in nursing in the United States began prior to the Second World War, the first baccalaureate nursing program in the State was not established until 1951 at Seton Hall University. Rutgers, The State University, designed and implemented a four-year baccalaureate degree program with a major in nursing in 1956, and four additional programs at this level were launched in subsequent years. The community college programs were underway by the late 1960's, with thirteen presently in operation. All of these are in addition to the hospital related diploma nursing schools, whose traditions are long standing, but whose numbers have been decreasing in a trend that is both nationwide and local in scope. In less than 25 years there has thus occurred a diversification in the types of programs in New Jersey as well as a concomitant diversity in the types of graduates produced. Table 1 traces the shifts which have occurred over the past seven years.

Table 1 -- Types of Basic Nursing Programs in New Jersey(2)

Year	Total	Baccalaureate	Diploma	Associate
1963-64	38	3	35	0
1971	41	6	23	12

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(2) Special Report to the Department of Higher Education, October, 1971, New Jersey State Board of Nursing. It should be noted that these figures, and the preceding narrative discussion, do not cover several no longer existent programs. We are told that in the late 1930's Seton Hall offered a Bachelor of Science in Nursing Education to diploma school graduates who wished to teach in nursing programs; Rutgers and Fairleigh Dickinson Universities offered two-year programs in nursing beginning in the early 1950's.

There exists then a varied pool of nursing personnel to consider, as well as a multiplicity of employment possibilities. Moreover, the latter are to some extent in a state of flux. It is imperative, therefore, to outline the scope of nursing practice responsibility, so that manpower needs in qualitative and, where possible, quantifiable terms can be effectively defined. The following discussion cannot be regarded as definitive; rather it represents a summary highlighting of critical areas which demand immediate attention from curriculum designers and program planners. Many nurse education programs are already attentive to these considerations; it likewise is acknowledged that other important elements which may result in significant changes, remain to be identified. It is recognized that such changes, as they become established and their consequences can be measured, will have a direct bearing on the manpower projections of this study in future updatings.

RECENT FACTORS AFFECTING PRACTICE AND EDUCATION

A. Nurse Utilization and Health Care Services

As the field of health care has grown, nursing practitioners have grown also, not only in their capacity to make judgments based on knowledge and critical analysis, but in their ability to assume responsibilities for patients and accountability for individual practice. Many professional nurses, particularly those with baccalaureate level preparation, are capable of functioning in more complex and extended roles with other members of the health team. As educational preparations are refined and intensified, they are better able to assume additional responsibility for the problems of health care delivery.

In practice settings, many nurses justifiably feel that their skills and abilities are still not being effectively utilized. While increasingly prepared to act independently in rendering nursing care, the majority of professional nurses continue to be limited to task-oriented delivery of patient care, because of traditional institutional procedures and policies, or the lack of innovation within nursing services, as well as the lack of cooperation of many physicians.

This situation has understandably led to dissatisfaction among many nurses and, as a consequence, they have abandoned the profession or their involvement in patient services. Nevertheless, we believe that:

Recommendation #1 - Involvement in health and patient care services should remain the continuing central concern of professional nursing and nursing education.

Moreover, while a preponderant percentage of active nurses in the state are employed in institutional situations, our remarks regarding the primacy of patient care are not intended to limit this concept to hospital-nursing home nurses. Diversity in practice outside the institutional walls, including public health nurses in the community and practitioners in schools and industry are included in this framework.

The Department is aware, nevertheless, of criticisms that some professional nurse preparatory programs are moving away from this emphasis. Whatever the validity of these charges, this plan reaffirms the centrality of patient service as the basic responsibility of professional nursing practice and educational programs. However, it is envisaged that ancillary nursing service personnel -- LPN's and Aides -- if they can continue to gain increasing competence and responsibility through upgrading of their preparatory programs, would thereby be further equipped to take over other tasks traditionally assigned to professional nurses. The latter personnel, on the other hand, in keeping with the growing sophistication of health services and their own educational preparations, will be assuming additional co-worker responsibilities as members of the health care team. (We emphasize, however, that from the Department's point of view the major focus for such shifting LPN responsibilities should be on the need for quality and continuity of service, rather than from the motive of hospital economics.)

Fostering a patient oriented focus for nursing responsibilities will not be accomplished by halting, much less turning back the clock upon the search by nurses for greater responsibility and professional satisfaction. Instead, new dimensions of activity for some RN's, which even now are emerging in an increasingly complex health care matrix, should be encouraged with suitable educational programs developed to prepare them. Reaffirmation of the precepts of nurse participation in patient care will result from broadening the parameters of their involvement in its delivery, not from its opposite.

Greater attention and definition also must be given to the fact that today not all RN's perform similar functions. "A nurse is a nurse is a nurse", is not a truism. As individuals, professional nurses also bring differing abilities, interests and educational qualifications to their practice. These distinctions should be recognized and supported not only in the responsibilities to which professional nurses are assigned and the way they are educated, but also in the licensure process. It is our strong recommendation, therefore, that:

Recommendation #2 -- The appropriate professional agencies should continue their efforts to design practice definitions that would reflect the emerging functional parameters of professional nursing practice. Once adopted, the State Board of Nursing should ensure, through appropriate licensing/credentialing, that standards of safety and competence in practice are being met. Such a step should not be taken without involvement of those professionals with whom nursing relates in the interdisciplinary setting of health care services.

Finally, it should be recognized that the growing complexity and rising demand for health service and the concomitant need for additional personnel, has led to a realignment of responsibilities and even the development of new personnel categories to work with physicians. The upgrading of professional nurse responsibilities to assume an appropriate share of this load, is wholly consistent with such a policy.(3)

B. Management and Specialization in Nursing Care

For many years, levels of practice have been largely distinguished by the amount and degree of administrative responsibility. A head nurse, once responsible for a group of patients in a geographical area, began to take on the administrative tasks of management, although frequently ill-prepared for the task. The effect of this climate of vertical mobility has often been a movement away from involvement in patient care to that of institutional management with accompanying financial remuneration and status. It is difficult to regard this as a healthy tendency if it serves as the sole, or even major outlet, for nurses seeking enhanced responsibility, status and financial remuneration. Alternative activity modes offering advancement and recognition should be developed, and buttressed by appropriate educational preparatory programs.

A trend to help counter the movement away from patient care centers around the emerging extended scope of nursing practice. Rather than offering mobility solely through the administrative route, there is developing a system of nursing practice based on accountability and responsibility for the nursing care of patients, as well as the extent of the theoretical bases required for the assumption of such accountability. The following is an anticipated outline of the roles and responsibilities of licensed nursing personnel:

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(3) This view is supported by a recent HEW report, which affirms that nurses need, can, and want to be prepared for increased responsibility as members of the health team. "Extending the Scope of Nursing Practice: A Report of the Secretary's Committee to study extended roles for nurses." Washington, D.C., Govt. Printing Off., November, 1971.

> The licensed practical nurse will continue to perform nursing care under the direction of the registered nurse, carrying out hygienic care and common medical therapies.
>
> The associate degree and diploma school graduate will continue to provide general nursing care to both acute and non-acute patients in institutions and in community agencies. These nurses participate in structured and defined settings with responsibility extending for short periods of time, such as an eight-hour shift or a hospitalization.
>
> The baccalaureate nurse may function in either a general or specialized setting, planning, implementing and evaluating programs of health and/or patient care in institutional or community settings.
>
> The masters degree graduate with a clinical major such as maternal-child nursing, psychiatric or medical-surgical nursing, for example, is responsible for the provision and quality of nursing care in the particular unit or area of concentration. In addition to planning and providing for quality care through appropriate nursing personnel assignments, this nurse maintains accountability for nursing care over a twenty-four hour period, or on a continuing basis in the community.

Appropriate progressive ranges of practice should be defined and adopted by the New Jersey State Nurses Association, with agreement from the medical association, other health disciplines and health care providers through the action of a State Joint Practice Committee. In planning these ranges, the Department stresses the need for a system which provides maximum flexibility for the individual nurse, separating out the levels of educational attainment required from those who will be engaged in the various levels of practice.

Recommendation #3 -- It is our recommendation that all educational programs in the State prepare nursing personnel to assume extended and expanded roles in nursing practice .

Recommendation #4 -- It is our further recommendation that nursing programs review their curricula to ascertain and ensure that they are part of a flexible and articulating system of nursing education (including the use of such evaluative tools as equivalency examinations).

An imminent example is the joint program of the Rutgers University College of Nursing -- Rutgers Medical School (CMDNJ) to prepare Pediatric Nurse Practitioners. Others which might be instituted are programs to prepare family health nurses, nurse psychotherapists, and nurse midwives, to name a few.

We recognize that some discussion has arisen as to the possible conflicting roles of the nurse and the physician's assistant, particularly since these roles are quite new and norms of education and function are not yet established. However, as programs are refined and their contributions to patient care are evaluated, it is anticipated that distinct identities will emerge. It is important that all such health workers establish practice boundaries that are mutually supportive, rather than in conflict.

Moreover, whatever the ultimate resolution of the functions of these two types of practitioners, we are anticipating that some nurses will move into these expanding areas of practice. For nurse manpower projection purposes, we are assuming that an additional percentage should be added to the demand for total active nursing manpower, as this factor was identified in the Department of Health's HMDP. If numbers of nurses do move into the expanded roles or become physicians' assistants, then they will not be functioning in the traditional roles upon which the manpower projections are based. With further experience and data, the admittedly conjectural estimate of this additional nurse demand shown below, will be re-evaluated.

(C) Innovation in Nursing Care Patterns

Designing new patient care patterns should be the responsibility of all health team members, with nurses taking an appropriate role. Nonetheless, nurses often feel that in the past they have seldom contributed to such planning activity, perhaps as a consequence of poorly prepared nursing leadership, or the insufficiency of time available away from designated patient assignments, or the failure of other health team members to include nursing personnel.

Recently, a significant proposal endorsed by the national professional nursing organizations has been advanced whose adoption would markedly affect the pattern of nursing care and education. Jerome Lysaught, Director of the National Commission on Nursing and Nursing Education, is the source of this suggestion for a reordering of nursing care responsibilities. It is significant that the Commission's proposal is not directly related to the present levels of educational preparation. Lysaught instead recommends that levels of nursing practice should be described solely in terms of two major patient services performed, which are defined as:

"Episodic: That area of concentration in nursing practice which emphasizes the curative and restorative aspect of nursing and which usually involves patients with diagnosed diseases, either acute or chronic.

Distributive: That area of concentration in nursing practice which emphasizes prevention of disease and maintenance of health and is largely directed toward continuous care of persons not confined to health care institutions."(4)

Since Dr. Lysaught evidently finds the distinctions inherent in the current associate, diploma and baccalaureate programs unrelated to his recommended levels of patient service, it appears that if the nursing profession intends to adopt this concept, then a profound recasting of nursing curricula is in order. The Department is not capable of making a judgment on the validity of the proposal's practice distinctions. Nevertheless, they appear to offer considerably greater clarity for curriculum planning purposes than do the current divisions between the associate and diploma programs as preparatory for patient care duties, and the baccalaureate programs as preparatory for patient management functions. For this reason, it is the Department's proposal:

Recommendation #5 -- That a nursing subcommittee of the Health Professions Education Advisory Council be formed and that it be composed of nurse educator, nurse practitioner and consumer representatives. This subcommittee should recommend to the Council specific guidelines, standards, and programs for nursing education throughout the State. While such recommendations would not imply any loss of institutional authority for individual programs, it is anticipated that a broadly constituted, inter-regional subcommittee would be capable of playing a leadership role in advising the Council and the Department.

It is expected that this committee will formulate recommendations that are consistent with the changing patterns of health delivery and of nursing practice and consequent licensure requirements.

We recognize that if such practice and related educational levels are adopted, then a distinction must ensue in the data related to nurse supply and demand levels. At the present time we know of no way to directly and accurately quantify the effects of such a policy decision. Nevertheless, should it be adopted, we would intend to analyze the manpower consequences resulting from the establishment of more precise service and educational program definitions, and their related licensure distinctions.

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(4) Lysaught, Jerome. An Abstract For Action. Report of the National Commission on Nursing and Nursing Education. New York, McGraw Hill, 1970, p. 166.

(D) Other Program Considerations

In addition to those recommendations discussed to utilize nurses appropriately, and to encourage nursing to reaffirm its concern with the delivery of patient care through clinical specialization, mobility in practice, and a redefinition of nursing care patterns -- we will address briefly a few other issues directly related to the educational process:

1. Basic Nursing Programs -- With the growth of the community college movement and the increasing stress placed by many nursing leaders on collegiate institutions as the only appropriate preparatory setting for professional nursing careers, controversy has arisen with respect to the continuing role of hospital diploma schools. Questions related to financing and the legitimacy of health care service institutions conducting educational programs, often receive more attention than those related to the ability of the graduates and their impact upon health service delivery. To those outside the nursing profession the issues argued frequently appear to be more related to institutional interests than concern for providing qualified personnel for effective patient care.

   One result of this dispute has been considerable public confusion as to how nurses are prepared; confusion for high school students in choosing a nursing education program; and confusion in the employment field in terms of nurse qualifications, abilities and salary definitions.

   Whatever the merits of this controversy, there is no question that significant shifts have occurred in the settings in which nurses are prepared. Table 1 indicated that in New Jersey there has been a decline in the number of diploma programs between the years 1963-1971, a 100 percent increase in the number of baccalaureate programs and the establishment of a previously non-existent opportunity at the associate degree level. Figures on admissions and graduations from these schools serve to further document the shift:

Table 2 -- Admissions(5)

	Total	Baccalaureate	Diploma	Associate
1966	1636	194	1,227	215
1970	2319	364	995	960

Table 3 -- Graduations(6)

	Total	Baccalaureate	Diploma	Associate
1966	1065	28	995	42
1970	1339	155	770	414

The educational background of our future nurse supply is obviously changing, and will be examined more specifically later in this section for its consequences upon manpower needs. This trend may continue in the future, although undoubtedly much will depend upon the creativity and flexibility of diploma school educators and their hospital administrators in charting their respective courses, and the existence of sound financial footings to support their solutions. This Department and the colleges must likewise be mindful of their responsibilities to ensure the continuity of supply within projected norms, should further closings take place, by supporting the growth of associate degree programs.

In the context of this Plan, however, we cannot attempt to fully adjudicate this controversy whose solution has thus far eluded the nursing and health care professions. Likewise we are not specifically projecting any decline of diploma nursing schools since the Department lacks full control of this situation, as well as the ability to predict future developments. Neither is this necessary for our purposes, since we are committed to maintaining the total necessary number of graduates in the associate degree/diploma category, whatever the mix between the two types of programs. The Department's recommendation, therefore, is:

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(5) Special Report to the DHE, New Jersey Board of Nursing, op. cit.

(6) Special Report to the DHE, New Jersey Board of Nursing, op. cit.

Recommendation #6 - To take such actions as are necessary to maintain the requisite total number of nurse program graduates at the appropriate level, particularly where there is need to compensate for any continuing decline in the number of diploma school graduates.

2. Relative Costs of Nursing Education -- Cognizance must be taken by the Department and society at large of the differential costs involved in the various nursing education programs. Historically, when nursing education resided only within hospital diploma schools, patients alone bore the cost. With the advent of collegiate programs, costs are now spread over the broader taxpayer base. Contemporary hospital diploma schools have increased sources of support, as do the collegiate programs, through tuition, state and federal funds. All programs which prepare professional nurses are assisted by the Department with per capita funding of New Jersey students at the rate of $600 per year.

   It is well known that programs in nursing, regardless of their locus, are relatively expensive to operate. The small student-teacher ratio in the clinical area runs instructional costs beyond the capabilities of some institutions. In the colleges costly programs such as nursing are, in part, supported by the revenues from other programs, a possibility not available to diploma nursing schools.

   Undoubtedly, in an era of rising costs, such comparisons will receive increasing attention. The Department also should begin to exercise some degree of supervision of diploma programs, in keeping with the financial contribution made to their operations.

3. Clinical Education and Resources -- Earlier comments on the centrality of patient service implicitly reaffirmed the significance of the clinical component of the nursing curriculum. We are aware that the emphasis upon clinical exposure in the diploma school programs has at times been characterized as excessive or misdirected; nevertheless, their recognition of its fundamental importance constitutes their greatest strength.

   In contrast, we believe that criticisms which have been directed by nurse employers at some baccalaureate and associate degree programs for failure to provide sufficient clinical training, have been well taken. We concur, of course, that no single template exists from which to design the extent and content of the clinical portion of the curriculum. Nonetheless, at the present time such a wide range prevails in the number of clinical hours required, as to raise question whether those programs at the extremes of the scale are not either faulting or overemphasizing this educational activity.

One of the responsibilities of the Subcommittee to recommend standards for nursing practice and curricula, should be to develop suitable parameters and guidelines for the extent and content of the clinical courses. It is therefore recommended that to assist the Subcommittee:

Recommendation #7 - The Department should conduct research to assess the effectiveness of the graduates in the employment setting of the three different types of programs preparing registered nurses in New Jersey today.

Another growing problem in nursing education is the availability of health care facilities for teaching purposes. In the central and northeast metropolitan areas of the State, where most nursing programs are presently located, clinical facilities to support them are at a premium. Priorities heretofore have been established largely on a first-come, first-served basis. More than one community college program presently uses facilities in another county, and one is considering affiliating with a facility in still a third, due to the size of its enrollment and the limitations in its own area.

Situations such as this, where they result in competitive scrambling for facilities , should be avoided in the future through better regional planning, and the establishment of priorities in the utilization of clinical facilities. Kennedy (7), Chimera (8), and the New Jersey State Nurses Association speak to this need emphatically, and it is strongly endorsed by this plan. The Department therefore recommends:

Recommendation #8 - That all nursing programs within the State re-evaluate their current supply of teaching facilities and resource requisites for program implementation. In situations where enrollments are to be increased or new programs started, regional agreement among the various programs and agencies should be sought regarding the cooperative utilization of available clinical facilities. Use of non-hospital clinical resources to support the educational program also should be re-evaluated in this context.

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(7) Kennedy, Johanna. "Nursing Needs in New Jersey", Public Health News, February, 1971, p. 26-28.

(8) Chimera, Nancy P. "A Plan for Nursing Education for New Jersey, 1966-1975". Report submitted to the Commissioner of Health, State of N. J., p.4.

4. Graduate Education -- It is commonly accepted that the State of New Jersey has not had sufficient undergraduate and graduate student spaces to serve the population seeking higher education; graduate level nursing education figures prominently in this deficit situation. One program at the graduate level, that of psychiatric nursing, has been in operation in the State for the last seventeen years, although funding has come solely from the National Institute of Mental Health. The graduates of this program have been few in number. Most nurses desiring advanced education have had to leave the state; in many instances, Chimera(9) points out, those who left New Jersey for such education did not return. The State Nurses Association has urged a correction of this situation for many years. It is the conclusion of this study that the highest priority should be given to establishing master level programs in a variety of specialty areas.(10)

Justification for this emphasis derives from the fact that it is from masters program level graduates that the majority of nurse teachers, administrators, researchers and clinical specialists are recruited. Quality programs, be they in educational institutions or health delivery agencies, require a stratum of prepared leadership. New Jersey has survived for many years by drawing its nursing leadership from the graduates of institutions in other states, without itself contributing to the national pool. Many faculty vacancies continue to exist in schools of nursing, and accrediting agencies have repeatedly emphasized the importance of properly prepared personnel in schools of nursing and health care institutions. If present supply lines are diminished or cut off, New Jersey schools and institutions would not meet national accreditation criteria.

It also is advocated that cooperative graduate nursing program and medical school arrangements be explored. This derives from the belief that nursing care is part of the health care continuum, and not a free standing profession whose growth can proceed in isolation from the medical profession.

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(9) Ibid.

(10) Nevertheless, while the need is clearly evidenced, it also is recommended that prior to the inception of additional programs at this level, cooperative interstate and regional arrangements should be explored to assure that the broadest range of programming is made available through shared use of faculty and facilities.

Therefore the Department recommends:

Recommendation #9 - That masters degree level nursing programs which would allow preparation for a variety of nursing responsibilities be established within the State as soon as possible. The advantages of collaborative arrangements should be fully explored in developing these masters level programs.

5. Continuing Education -- Sporadic short-term courses, "refresher" courses, and workshops have been implemented in the State in the past few years. As needs were evidenced, e.g., as coronary care and hemodialysis units opened, courses were offered to prepare nursing manpower for these specialty areas. If this pattern persists, continuing education programs would respond only to immediate problems rather than to the ongoing and long-range needs of the professional group. Given the increasing sophistication of health care technology, graduates do and will continue to require assistance in upgrading their knowledge. Non-degree, continuing education programs should be sponsored throughout the State. While those colleges and universities offering nursing programs are the most appropriate institutions to undertake this responsibility, it is urged that they develop a unified statewide plan for continuing nurse education.

   As indicated earlier, the Department is increasingly aware of the problems associated with mounting and sustaining effective continuing education programs and therefore it strongly recommends:

Recommendation #10- That the Nursing Subcommittee of the Health Professions Education Advisory Council should develop a statewide continuing education plan. Such a plan should insure that a representative range of subject matter will be available to interested R.N.s during the course of each year, at sites dispersed through all regions of New Jersey. Recommendations relating re-licensure procedures to continuing education activity, likewise should be considered.

6. Articulation and Transfer -- Forty-one programs in the State prepare students to become registered nurses. Transfer of credits between the three types of programs is at present still more difficult than is desirable,

and often requires repeated courses resulting in the expenditure of additional time and money. Initiatives undertaken in other states, on the other hand, are currently providing a more fluid articulation process, as well as credit for life experiences, and even self-education mechanisms. The nursing programs in this State must address themselves further to these questions. Effective collaboration should be established with the recently formed Thomas Edison College, which has been specifically charged with developing mechanisms and concepts for program articulation and equivalency testing, with particular attention to be given to the nursing field.

Finally, as a means of coping with the increased demand for baccalaureate program graduates to be discussed below, four-year institutions are strongly urged to consider initiating upper division baccalaureate nursing programs, to provide transfer opportunities for diploma and associate degree holders.

In considering this important problem of articulation and transfer the Department recommends:

Recommendation #11 - That the Nursing Subcommittee of the HPEAC assume the task of specifically analyzing and elaborating guidelines which will affect articulation and transfer among nursing programs within the State, and;

Recommendation #12 - That as a part of this task they investigate and recommend to the Department opportunities for the initiation and expansion of articulating nursing programs to provide the necessary transfer opportunities for diploma and associate degree nurses.

NURSING MANPOWER

Few of the factors just discussed lend themselves to statistical analysis owing to the lack of data and the difficulty of quantifying emerging trends whose full impact is yet to be known. The HMDP section on Nursing (Appendix E, pages 135-168) discusses all the basic factors which are included in its projections. The Department, in reviewing these projections, has considered two additional factors not discussed in the HMDP. These factors include: 1) the splitting of their combined diploma, A.A.S. and baccalaureate nurse projections into two sub-categories, placing diploma and associate degree nurses in one, and baccalaureate nurses in the other; 2) calculating an additional demand factor relating to a projected increased demand for nurse clinicians.

By considering these additional factors a clearer picture of the status of nursing emerges with relation to supply and demand, and of the implications for planning a comprehensive program of nursing education in New Jersey.

A. Health Manpower Data Project Projections

Table 4 has been constructed on the basis of the professional nurse supply and demand projections identified in Tables 10 and 12, pages 72 and 85 of the HMDP:

Table 4-- Professional Nurse Manpower Findings: Combined Adjustment -- Minimum and Maximum Impact Legislation-Statewide Basis

	SUPPLY				DEMAND			DIFFERENCES (-Denotes Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Min-Impact Leg.	32517	39504	47405	56887	41003	46516	52328	-1499	889	4559
Max-Impact Leg.	32517	39504	47405	56887	44229	50175	56444	-4725	-2770	443

As previously mentioned, the above figures will now be adjusted by the consideration of two additional factors which will create a new basis for projecting the professional nurse manpower needs in New Jersey.

B. Creation of Sub-HMOC Categories for Professional Nurses

It was stated earlier that a differentiation should be made within the category of professional nurses with respect to broad practice functions. It also was noted that while the Lysaught Commission's report proposes a compelling distinction at the practice level, this categorization was not tied to present educational program levels. Nevertheless, we are convinced that nursing education programs should begin to elaborate such distinctions, closely geared to the eventual practice activities of their graduates. Moreover, it is our opinion that planning will be facilitated if the supply and demand for RNs are broken down into discrete categories reflecting the educational preparations of nurses.

For this reason, we are changing the HMDP data by separating the RN pool into two sub-categories. The first consists of graduates of associate degree and diploma programs, the second of graduates of baccalaureate and higher level programs. In December, 1971 the Department analyzed the educational composition of all registered nurses maintaining current licensure with the State Board of Nursing, noting the highest degree in nursing obtained. On the basis of a six percent random sample, the breakdown depicted in Table 5 was obtained.

Table 5--Active Registered Nurses by Educational Preparation-1971 (11)

Educational Preparation	Number	Percent
Associate	1,146	2.94
Diploma	31,147	79.92
Sub-total:	32,293	82.86
Baccalaureate *	6,678	17.14
TOTAL:	38,971 **	100.00

* Represents a major in nursing; degrees in other majors are not included.

** Of the total pool, 964 also obtained masters in nursing degrees; the sample was too small to estimate the number of doctorates in nursing.

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(11) The total supply of active Registered Nurses is higher than the figure of 32,517 shown for 1970 in the HMDP, not only as a consequence of actual increments to the pool, but also because these figures include persons active in other states as well as New Jersey, which is not the case with the HMDP figures. Neither do these figures reflect persons not responding to the State Board question regarding educational preparation. However, we are assuming that the educational preparation of those active out-of-state, and non-respondents, would not change the percentage mix shown in the final column.

The percentages shown in the right hand column of Table 5 will be applied to the supply line in the creation of the two sub-HMOCs for professional nurses.

With respect to construction of new demand lines for the sub-HMOCs, one must determine what proportion of the professional nurse pool should be prepared at the various educational program levels. A 1964 Surgeon General's report recommended that 3.7 percent of RNs should hold masters degrees or higher, 14.0 percent baccalaureate degrees, while the remaining 82.3 percent should hold diploma or associate degrees.(12) It should be noted that this report called for a division which is virtually identical with the current breakdown among active nurses in New Jersey. However, a 1967 update of the Surgeon General's report revised these recommended percentages as follows: 40.0 percent baccalaureate and higher degrees; 60.0 percent diploma or associate degrees.(13)

To assist in judging the practicality, and perhaps even the merits of these two recommendations, the results of a reconstruction of Table 4 to create two sub-HMOCs for professional nurses, should be examined. Tables #6 a and b show the supply lines broken down according to the existing 82.9 and 17.1 percent ratio (Table #5) between associate/diploma and baccalaureate/higher education preparation levels, while the demand lines follow the 60/40 percent split suggested in the 1967 revision of Surgeon General's Report. Tables #7 a and b show the same supply lines (the 82.9/17.1 split as it presently exists), but the demand lines follow the 1964 Surgeon General's Report which suggests a 82.3/17.7% split between associate/diploma and baccalaureate/higher level programs.

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(12) Surgeon General Consultant Group on Nursing, "Toward Quality in Nursing", U.S. Department of HEW. Public Health Service Publication #992, Washington, D.C., 1963, p. 23.

(13) Nurse Training Act of 1964: Program Review Report, Public Health Service Publication #1740, Washington, D.C., 1967, p. 13.

Table #6 Nurse Manpower Demand - based on the 60/40 ratio developed in the 1967 revision of the Surgeon General's Report

a. Associate and Diploma Programs - 60% of professional nurses.

	SUPPLY				DEMAND			DIFFERENCES (-Denotes Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Min-Impact Leg.	26944	32733	39280	47137	24602	27910	31397	8131	11370	15740
Max-Impact Leg.	26944	32733	39280	47137	26537	30105	33866	6196	9175	13271

b. Baccalaureate Programs - 40% of professional nurses

					DEMAND			DIFFERENCES (-Denotes Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Min-Impact Leg.	5573	6771	8125	9750	16401	18606	20931	-9630	-10481	-11181
Max-Impact Leg.	5573	6771	8125	9750	17692	20070	22578	-10921	-11945	-12828

It will be readily seen that the "reconversion" of the forecast excess of associate and diploma program graduates, to make up the forecast shortage of baccalaureate holders, would impose an incredible burden on our institutions. Table 3 noted that our baccalaureate nursing programs produced only 155 graduates in 1970. To be able to add to that total by even the minimum of 9,630 indicated as needed by 1975, is highly implausible. Nor is it believed that our health care delivery needs will call for such a radical shift in the educational composition of the professional nurse pool.

Table #7 Nurse Manpower Demand - based on the 82.3/17.7 ratio developed in the 1964 Surgeon General's Report

a. Associate and Diploma Programs - 82.3% of professional nurses.

	SUPPLY				DEMAND			DIFFERENCES (-Denotes Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Min-Impact Leg.	26944	32733	39280	47137	33745	38283	43066	-1012	997	4071
Max-Impact Leg.	26944	32733	39280	47137	36400	41294	46453	-3667	-2014	684

b. Baccalaureate Programs - 17.7% of professional nurses

	SUPPLY				DEMAND			DIFFERENCES (-Denotes Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Min-Impact Leg.	5573	6771	8125	9750	7258	8233	9262	-487	-108	488
Max-Impact Leg.	5573	6771	8125	9750	7829	8881	9991	-1058	-756	-241

While a shift in the educational composition of the professional nursing pool as recommended in the 1964 Surgeon General's Report might still call for at least a temporary expansion of associate/diploma as well as baccalaureate level activity, the dimensions of the task are far more compassable. It is the 1964 Report's recommendations, consequently, which are being followed by this plan for educational program planning purposes. Such shifts of personnel to the baccalaureate pool undoubtedly will not occur unless there is adherence to the earlier recommendations on the need to facilitate articulation between associate/diploma programs and those at the baccalaureate level.

C. Additional Demand: Expanded and Extended Roles

Finally, also as indicated previously, we are adding to the forecasted demand a slight percentage increase to account for those RNs who will assume expanded and extended responsibilities. While we acknowledge that this increase will appear small to most observers, we have no basis for precisely prognosticating any amount, and must rely upon future experience before we can validate any percentage increase. Tables 8 and 9 therefore adjust tables 7a and 7b for a one percent rise in the need for associate and diploma program graduates, and a two percent increase for baccalaureate level graduates. By taking this further statistical step, moreover, we thereby establish the methodological framework for future analysis.

Table #8--Nurse Manpower Demand-Associate and Diploma Programs
(Table 7a--Adjusted for Expanded Role and
Physicians Assistant Activity)

	SUPPLY				DEMAND			DIFFERENCES (-Denotes Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Min-Impact Leg.	26944	32733	39280	47137	34082	38666	43497	-1349	614	3640
Max-Impace Leg.	26944	32733	39280	47137	36764	41707	46918	-4031	-2427	219

Table #9--Nurse Manpower Demand-Baccalaureate and Higher
(Table 7b-Adjusted for Expanded Role and
Physicians Assistant Activity)

	SUPPLY				DEMAND			DIFFERENCES (-Denotes Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Min-Impact Leg.	5573	6771	8125	9750	7404	8397	9447	-633	-272	303
Max-Impact Leg.	5573	6771	8125	9750	7986	9059	10191	-1215	-934	-441

D. Closing the Manpower Gaps

The data from Tables 8 and 9 will now be graphed on a regional basis, since such a large number of personnel are involved and preparatory programs already are and can be further dispersed throughout the State. Graphs numbered 1 through 5 show the situation for associate and diploma program graduates; graphs numbered 6 through 10 the forecasted status for the sub-HMOC for graduates of baccalaureate and higher programs. A reasonable demand line has been constructed between the maximum and minimum lines, as discussed earlier in the general manpower forecasting section. Where upward "jogs" occur in the supply lines in the year 1975, they reflect the increased number of graduates anticipated from programs approved since 1970.

Both sets of supply and demand curves show a converging trend, although this is more pronounced in the associate and diploma sub-HMOC. With respect to the latter group, an oversupply is actually forecast before 1985 in the metropolitan and southern regions. In the baccalaureate sub-HMOC an oversupply would emerge in the period studied only in the metropolitan region. Because of the converging nature of the supply and demand situation, no "strategy line" is shown for closing the gaps. Increasing the number of graduates in either sub-HMOC beyond current productivity, will hasten the onset of an oversupply situation. At the maximum, it would appear that any increase permitted in the number of professional nurse graduates, to rapidly close the admittedly large current absolute gaps, should occur only in existent programs for a limited and closely controlled period of time. As previously noted in the narrative discussion, there also is justification for encouraging some movement of personnel from the associate and diploma sub-HMOC, to the baccalaureate and higher sub-HMOC.

The tables which are inset into the graphs show on the first line the difference (need gap) between supply and demand. The second line of the inset further adjusts the need gap upward to provide additional personnel to replace those who will graduate from New Jersey schools but will not remain to practice here ("in-state survival" factors: 80 percent in the case of associate/diploma program graduates; only 65 percent for baccalaureate/higher). The latter adjustments do not change the previously noted trends toward oversupply; they merely set the period of oversupply somewhat further into the future.

With respect to those manpower forecasts, the Department therefore recommends:

Recommendation #13 - That additional professional nursing manpower should be produced within the State in accord with the following priorities:

1. *The development and expansion of articulating nursing programs leading to the baccalaureate degree;*
2. *Closely controlled increased enrollments in present programs during the period when absolute shortages continue to persist;*
3. *The creation of new programs when and if indicated by regional demand.*

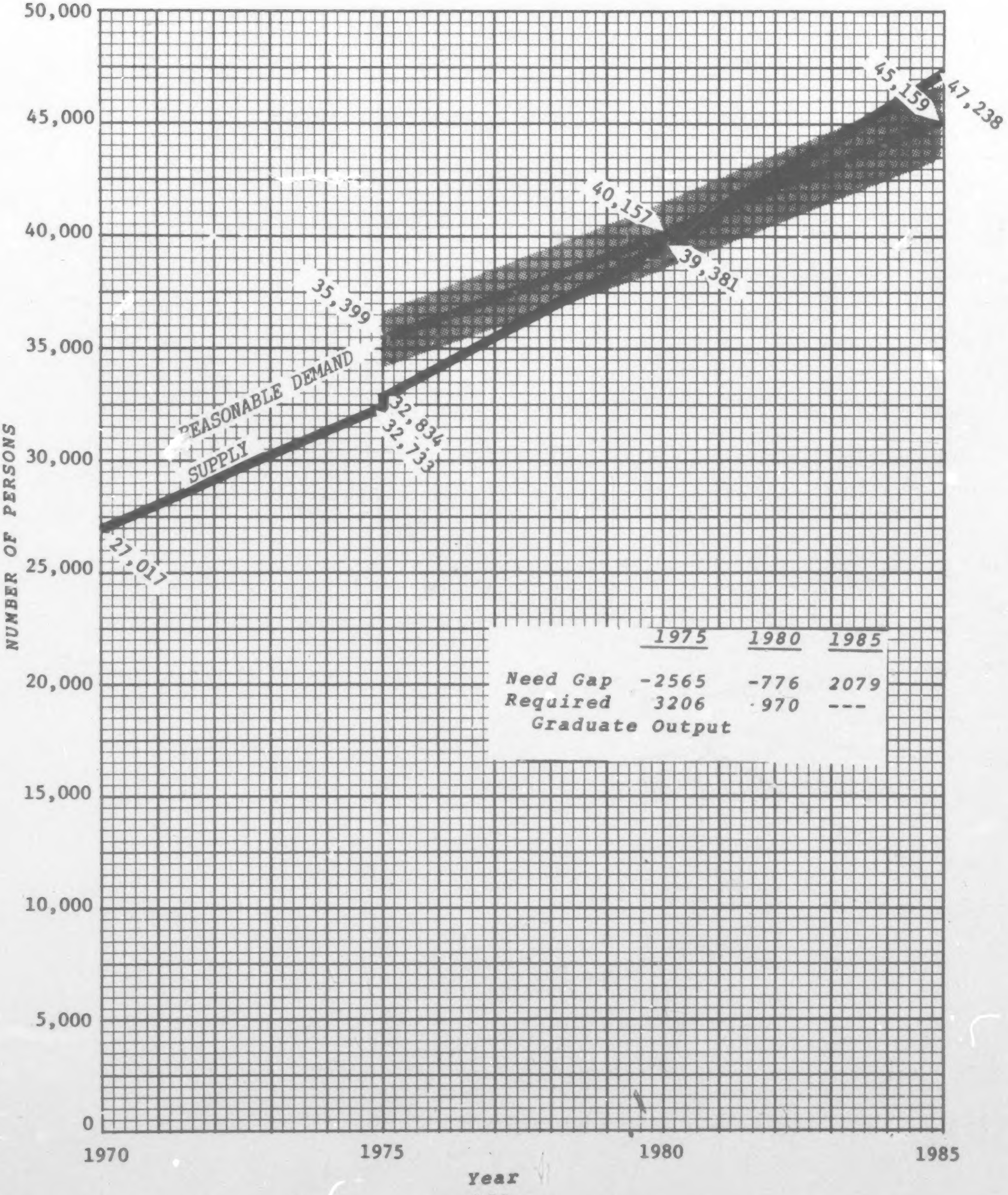
SUMMARY

Meeting the nursing manpower requirements outlined above can be accomplished, given the cooperation of individuals and agencies involved in nurse preparation and utilization. As more data is accumulated and research initiated, the quantitative data as well as the qualitative factors will be reviewed and revised. In the pursuit of excellence in nursing education and practice, the Department of Higher Education will rely heavily on the nursing profession and the disciplines with which it relates to design programs and timetables to implement the recrecommendations contained herein.

GRAPH #1

HMOC: Nurses (R.N.)
Sub-HMOC: Associate & Diploma

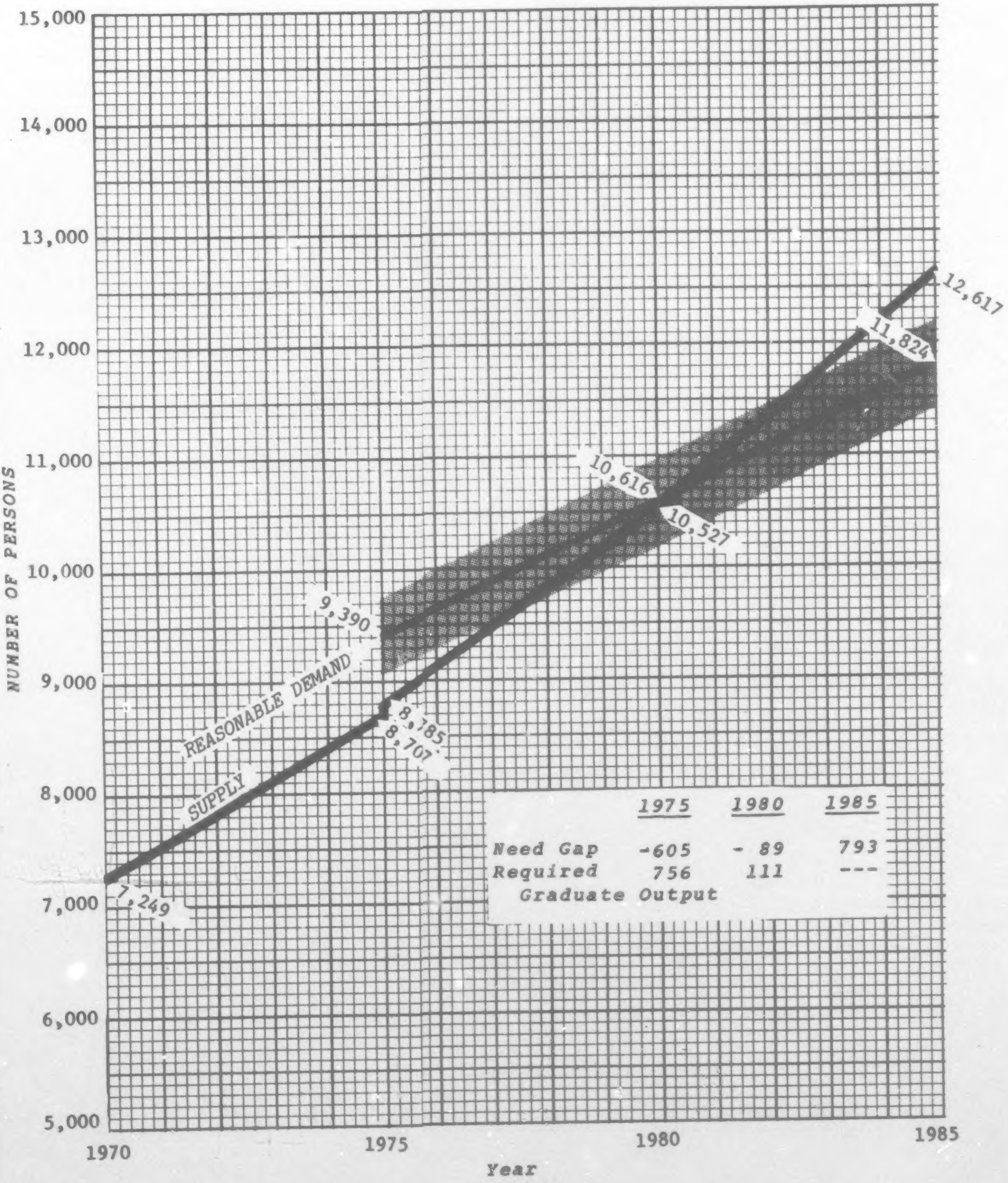
Statewide Basis



	1975	1980	1985
Need Gap	-2565	-776	2079
Required Graduate Output	3206	970	---

GRAPH #2
HMOC: Nurses (R.N.)
Sub-HMOC: Associate & Diploma

AREA 1

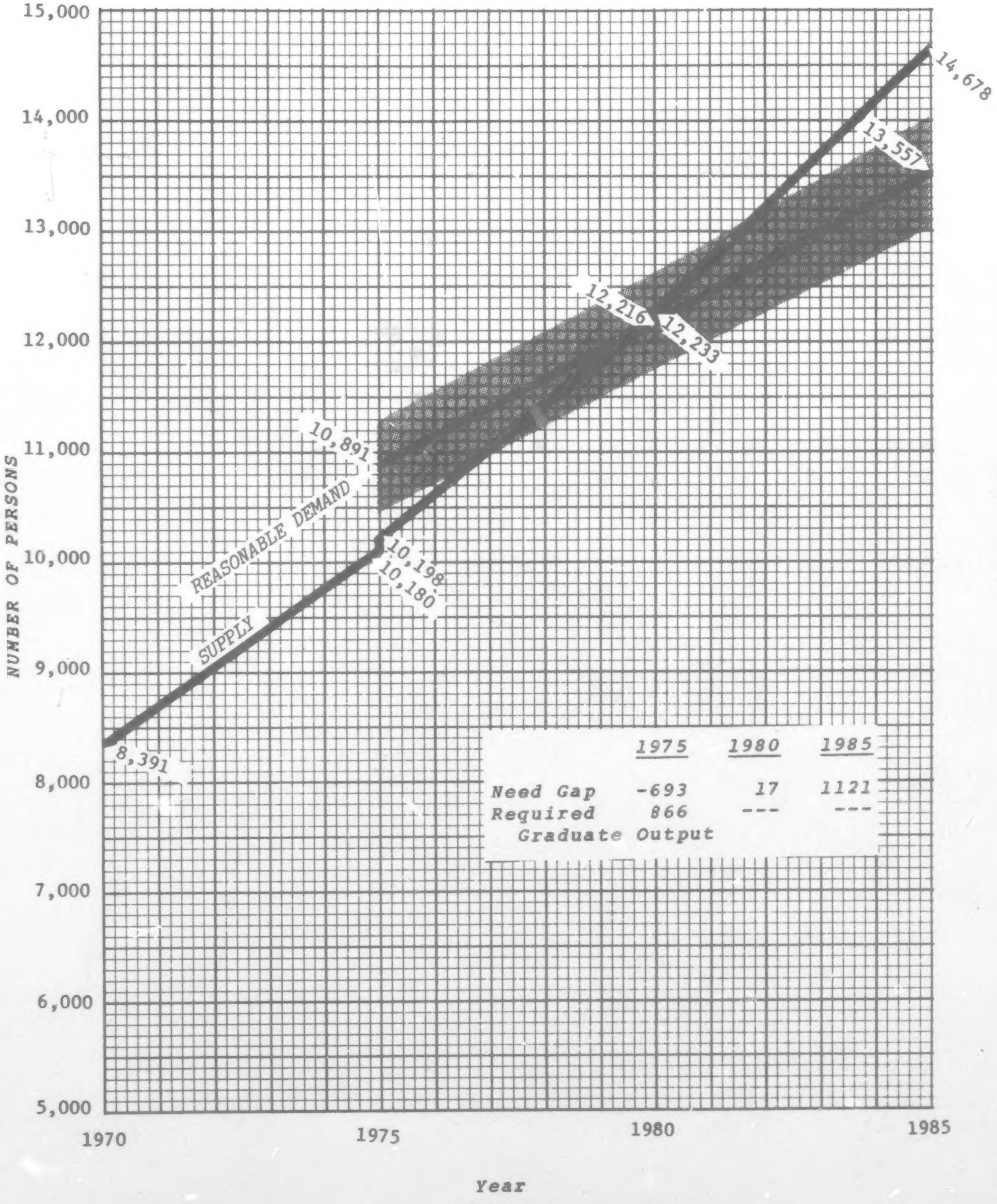


	1975	1980	1985
Need Gap	-605	- 89	793
Required Graduate Output	756	111	---

GRAPH #3

HMOC: Nurses (R.N.)
Sub-HMOC: Associate & Diploma

AREA 2

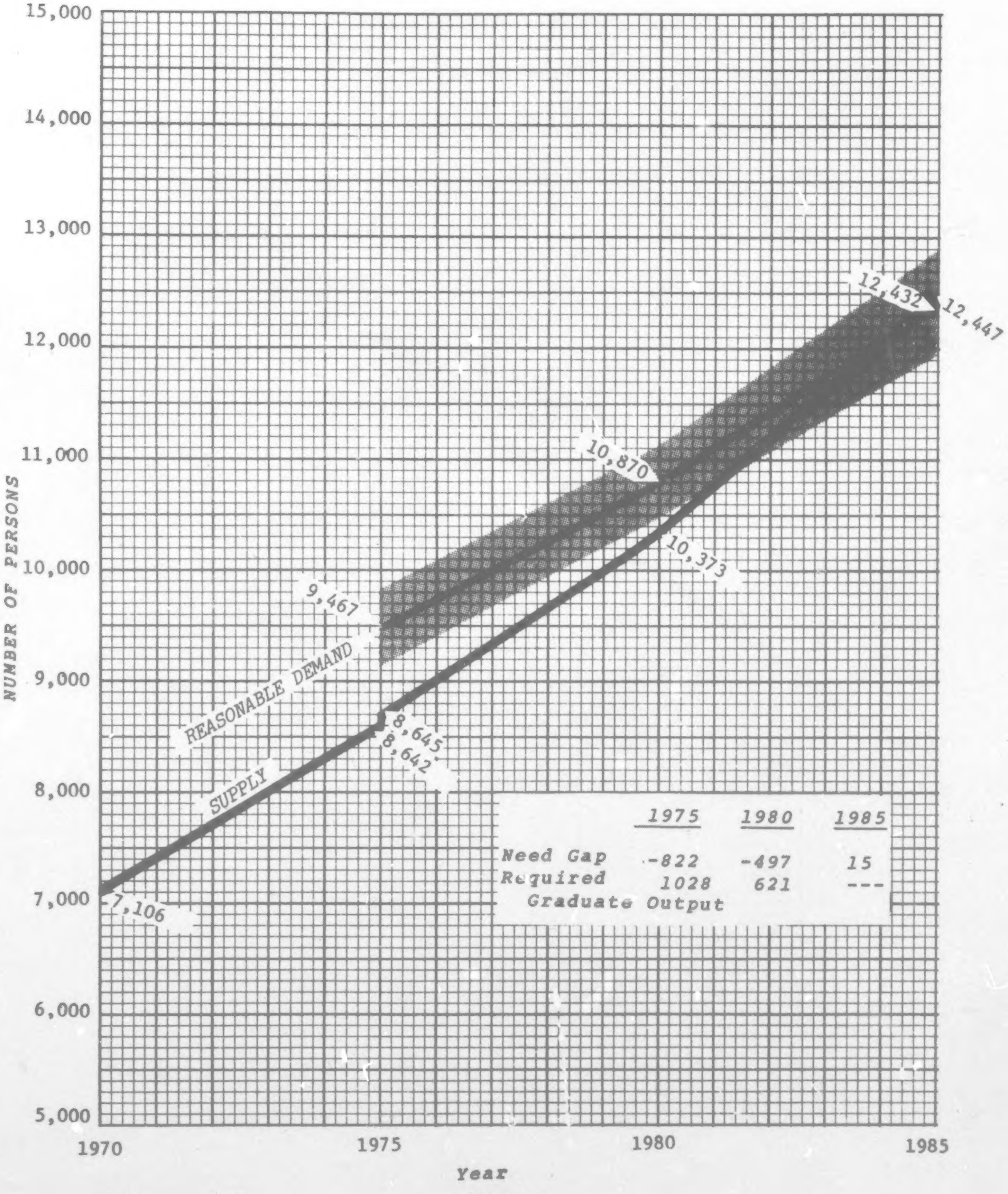


	1975	1980	1985
Need Gap	-693	17	1121
Required Graduate Output	866	---	---

GRAPH #4

HMOC: Nurses (R.N.)
Sub-HMOC: Associate & Diploma

AREA 3



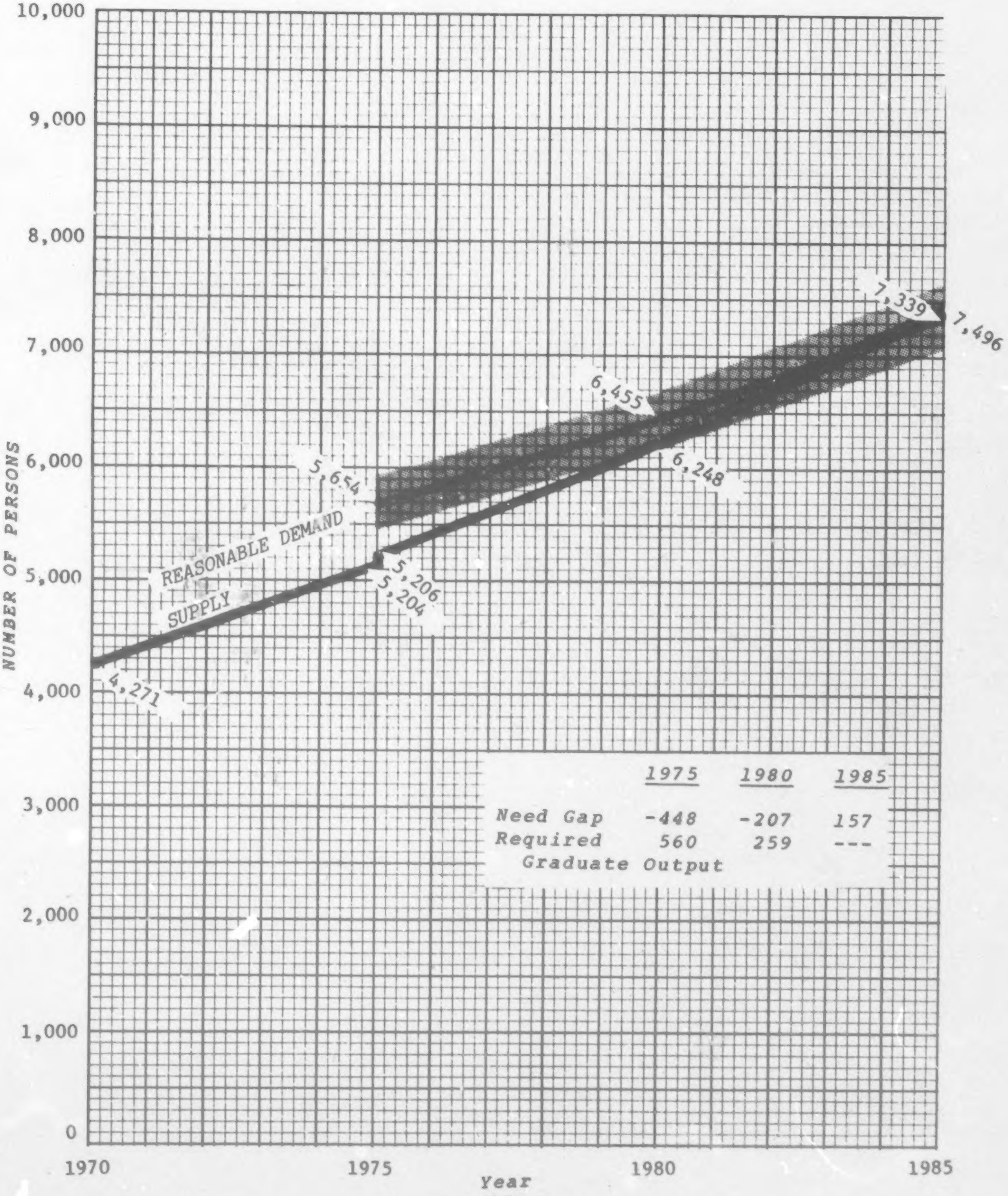
	1975	1980	1985
Need Gap	-822	-497	15
Required Graduate Output	1028	621	---

Snd f 2

GRAPH #5

HMOC: Nurses (R.N.)
Sub-HMOC: Associate & Diploma

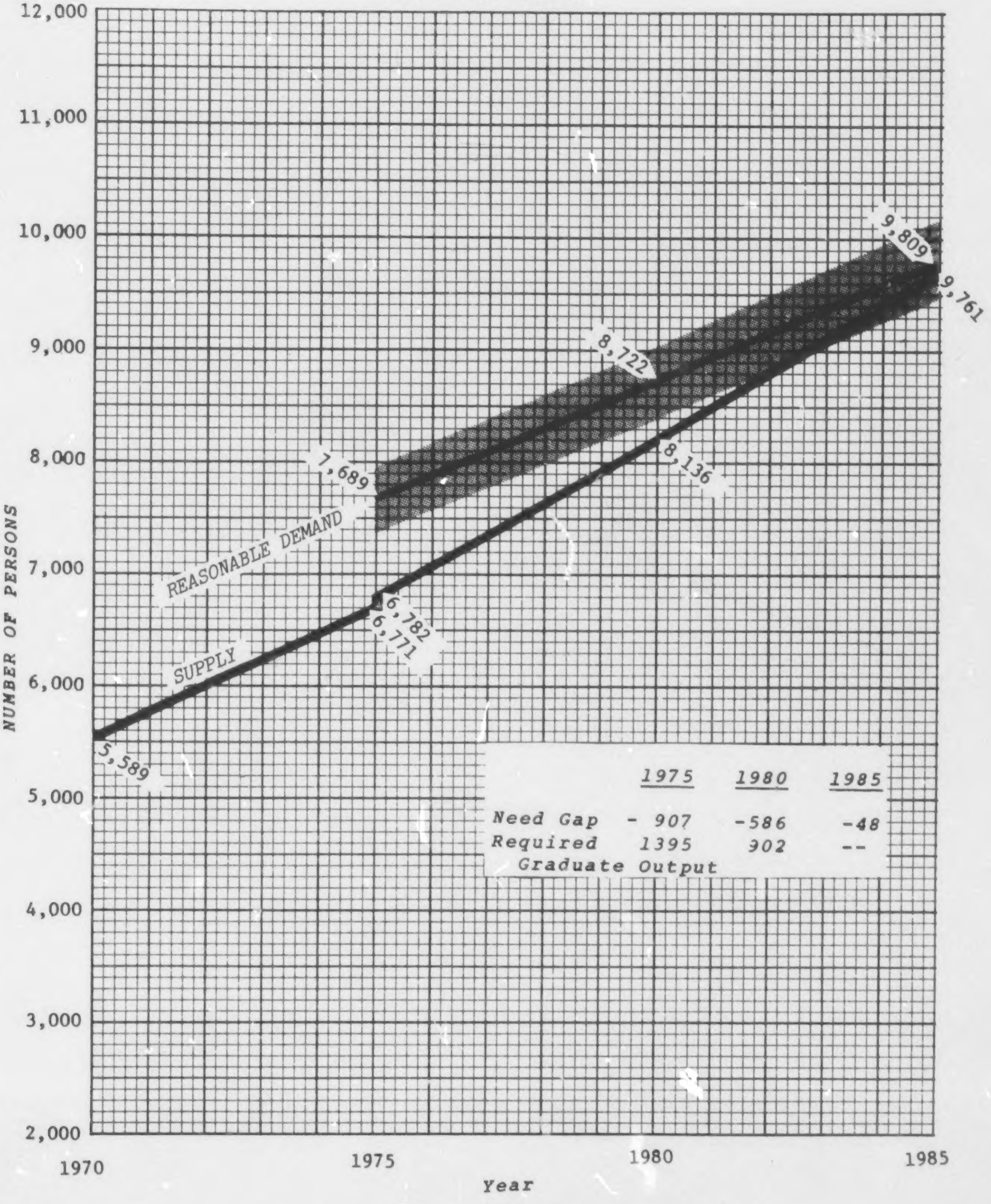
AREA 4



	1975	1980	1985
Need Gap	-448	-207	157
Required Graduate Output	560	259	---

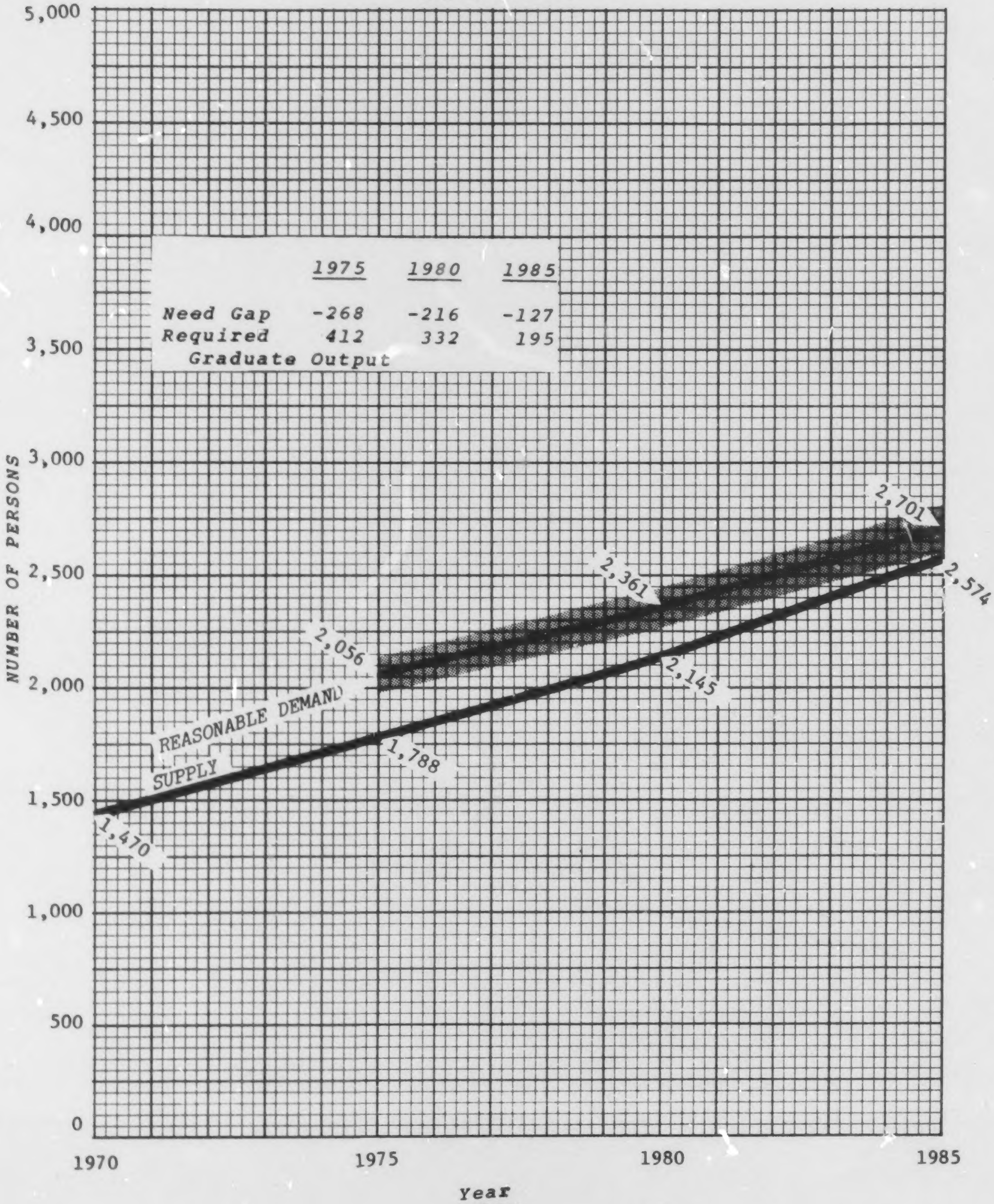
GRAPH #6

HMOC: Nurses (R.N.)
Sub-HMOC: Baccalaureate &
Higher
STATEWIDE BASIS



	1975	1980	1985
Need Gap	- 907	-586	-48
Required Graduate Output	1395	902	--

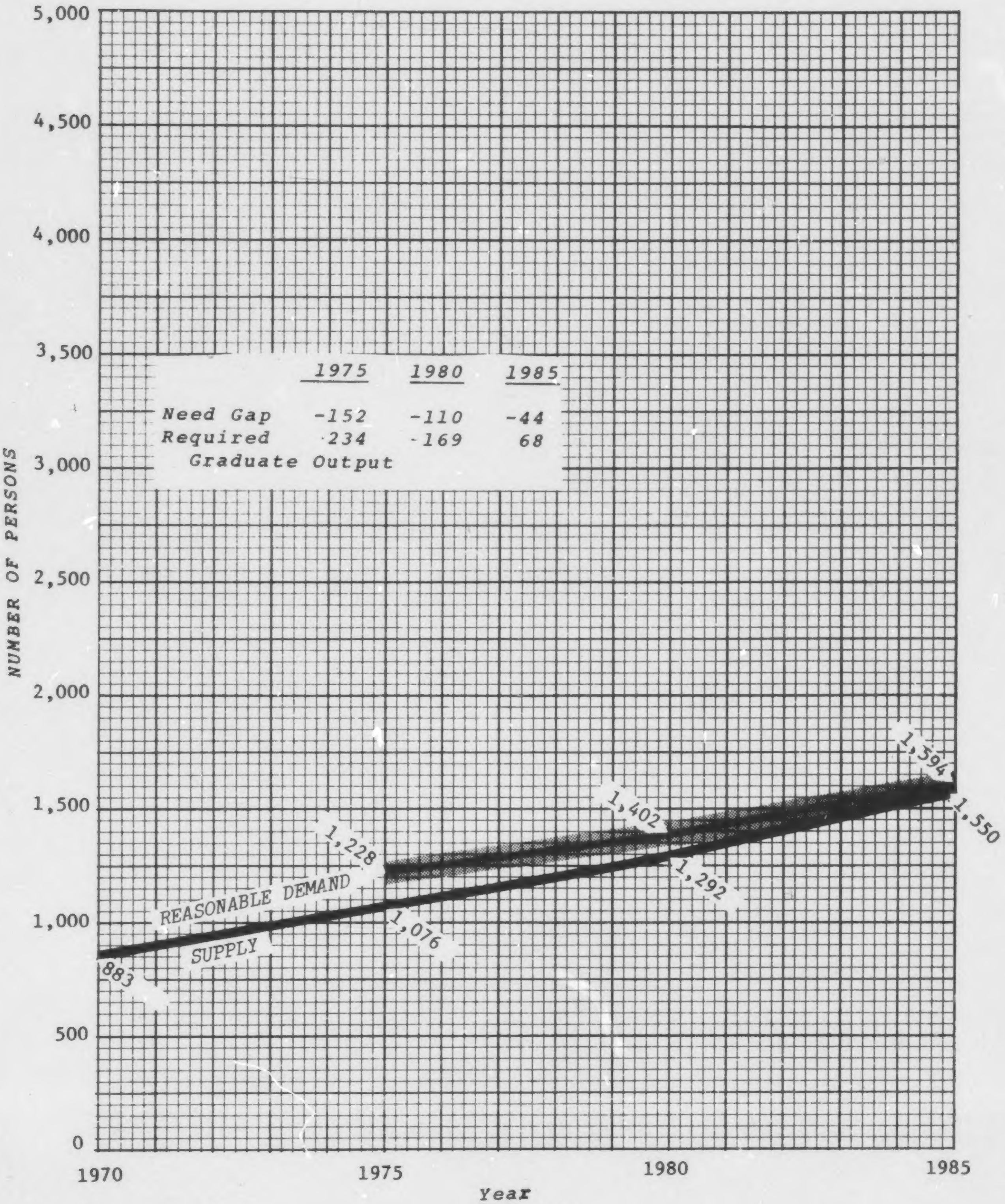
GRAPH #9
HMOC: Nurses (R.N.)
Sub-HMOC: Baccalaureate & Higher
AREA 3



	1975	1980	1985
Need Gap	-268	-216	-127
Required Graduate Output	412	332	195

GRAPH #10

HMOC: Nurses (R.N.)
Sub-HMOC: Baccalaureate & Higher
AREA 4



	1975	1980	1985
Need Gap	-152	-110	-44
Required Graduate Output	234	169	68

DENTAL HEALTH PERSONNEL

It was pointed out in Chapter II that the dental health fields, due to their present level of specialization and increasing sophistication, permit a more integrated analysis that other HMOC clusters addressed in this master plan. Moreover, the predicted manpower shortage of dentists, especially, is very great when compared to most other HMOCs, which necessitates a hard look at ways and means to overcome such deficits that go beyond efforts merely to increase the number of graduates in this field. Thus we first approach the dental health HMOCs in a unified manner which causes some overlap between categories, but also recognizes the interrelationship of their duties. That interrelationship is in turn a function of the three levels of oral health care, which are:

1. The development of preventive measures which will in fact prohibit or greatly reduce the incidence of oral diseases.
2. The diagnosis and interception of oral disease aimed at restoration to a maintenance condition free of disease, and with adequate function and appearance.
3. The development of strategies for treating the acute manifestations of oral disease.

Within the broad field of dental care a large portion of present activity centers on the third level, namely the treatment of acute conditions. Most expert opinion is in accord that the professional complex could, however, rapidly move toward the second state of control and ultimately to the first level of prevention. It is believed that the profession, if it so desires, could remove many of the barriers which have previously made dental care inaccessible to many members of the population. Moreover, the development of a more efficient delivery system which focuses primarily on the prevention and control of disease, and secondarily on its necessary treatment, is seen as within the grasp of the dental health team. It is our belief that achievement of a delivery system with such goals will be greatly facilitated by appropriate delegation of responsibility for the second and third levels of oral health care to dental auxiliaries. Later in this section, in our discussion of the dental manpower categories, we will offer recommendations to help make this possible.

Looking at the national picture one is encouraged by positive signs in all three professional groups (organized dentistry, educators, and examiners) which play a role in the shaping of future dental care. The nation's practicing dentists, late in 1971, in a vote of the American Dental Association's House of Delegates, strongly endorsed virtually all of some ninety Task Force recommendations relating to National

Dental Health Care.[1] These resolutions stress the expanded utilization of dental auxiliaries so that more care might be delivered to more people. They endorsed and reaffirmed their earlier position that major gains in dental health care would be made if the complete dental health needs of the children of this country were met.

The second major body of dental professionals, the educators, are similarly in agreement as to the direction of the profession and are gearing their curricula to produce more socially aware and biologically oriented dentists who appreciate the concepts involved in the prevention of dental disease, and have the management skills to enable them to direct a dental health team in the maximum delivery of dental service.

Many of the problems discussed earlier in this master plan relating to licensure and certification of health professionals are particularly applicable in the field of dentistry. Unfortunately, the third major force on the practice of dentistry, the state dental examiners, who are empowered with the necessary task of protecting the public, have in the past in their application of this principle restricted the use of auxiliaries in a way that currently inhibits their efficient utilization. It is encouraging to note, nevertheless, that at least 36 states have secured the enactment of legislation which, to varying degrees, removes these strictures.[2] Most other states are presently considering similar legislation which would help the dental team to operate as an efficient deliverer of health service.

The Dental Practice Act of New Jersey (based on a 1937 revision of a 1915 statute) continues to be restrictive, although it is hoped that revisions will be enacted as soon as possible so that the available dental auxiliary manpower in this State will be utilized to its fullest capacity.

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(1) Journal of the American Dental Association, November 1971, p. 552. Summary of the ADA House of Delegate's Action on the Task Force Report of the Nation's Dental Health.

(2) Status of Dental Practice Acts Pertaining to Expanded Duties for Dental Auxiliaries and Recognition of Dental Licenses Granted by Other States. Published by the Resource Analysis Branch, Division of Dental Health, N.I.H., in December 1970 with March 1972 revisions supplied by Dr. Donald W. Johnson, Manpower Studies Branch, Division of Dental Health.

Functions of the Dental Health Team

At the present time there are generally considered to be five members of the Dental Health Team whose titles and duties are outlined below:

1. The Specialist - The specialist is a dentist who in addition to his D.M.D. or D.D.S. degree has completed two or three additional years of training and has become certified to practice a dental specialty such as Orthodontics, Pedodontics, Oral Surgery, etc.

2. The General Practitioner - After completing training for the D.D.S. or D.M.D. the general practitioner can confidently handle almost all dental problems. In some cases, however, when complications are severe, the need for consulting a specialist arises.

3. The Dental Hygienist - The Dental Hygienist has had a traditional role on the dental health team which involved prophylaxis (the cleaning of teeth), the taking of x-rays, the application of fluoride or other anti-cariogenic agents, and the dental education of the patient. In recent years, however, the role of the hygienist has been re-examined for at least two reasons:

    a. Many hygienists themselves have expressed a high level of job dissatisfaction due to the repetitive and unchallenging nature of the work which was often assigned them by dentists (i.e., "overtrained" for the tasks presently performed).

    b. Many dentists seeing the potential for the greatly expanded utilization of their hygienists, have encouraged experimentation which has led to the redefinition of their traditional role.

    This redefinition of the hygienist's role has included experimentation with expanded functions such as the making of preliminary dental impressions, the insertion of filling materials, the preliminary history and charting of the patient's dental condition, and the administration of local anesthesia. Hygenists are also expanding their educational roles through increased employment in other dental care settings such as within schools, hospitals and community health centers.

4. The Dental Assistant - The dental assistant's role has varied greatly within different dental offices. In the past they have performed a multitude of necessary but non-treatment oriented tasks within the office. Such tasks have included answering the telephone, recording appoint-

ments, keeping files, billing, assisting patients into the chair, preparation of equipment and materials, and the general cleanup of the office. In many office, however, they also have been used by the dentist as a highly skilled treatment-oriented auxiliary engaged in such activities as the mixing of filling and impression materials, four-handed dentistry, and patient management. National surveys show that for many years dentists have combined the treatment related and non-treatment related aspects of dental assistant utilization by employing only one person to do all of the above. More recently dentists have learned that employing two or more auxiliaries and having them specialize in the different areas can produce a more efficient office and results in better patient care as well as increased income. The natural extension of this specialization has been the desire on the part of both the auxiliary and the dentist to expand the role of the treatment-oriented assistant to include a number of intra-oral expanded functions. These functions include the making of dental impressions and radiographs, prophylaxis, application of topical fluoride, a greater role in the preliminary history and charting of patients' dental health condition, as well as full involvement in the oral health education of all patients.

5. Dental Laboratory Technician - Dental laboratory technicians have been traditionally trained as apprentices. Recently, however, a number of formal educational programs have been developed most of which are two years in length. Approximately 94 percent of all technicians are commercially employed while the other 16 percent are employed by dentists.(3) These percentages are gradually shifting as more group dental practices are formed and technicians are hired privately by the group. Technicians are responsible for the fabrication of dental prostheses such as dentures, crowns, and bridges. They are not licensed and fulfill assignments for the dentist only after receiving a work authorization instructing them in the design and construction of each prosthesis.

Education of the Dental Health Team

The viability of the health delivery team approach (as outlined in Chapter II) can perhaps be most effectively demonstrated by the increasingly sophisticated delivery of dental services. Over the past several years, there has been some movement within the profession to re-organize the private care delivery system toward the development of group practice arrangements and efficient auxiliary utilization which together form the basic underpinning of the team approach in dentistry. (4) In order to advance this recent trend and to foster its development during the professional training of the dental health team, our dental and dental auxiliary schools should consider the following recommendations:

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(3) 1968 Survey of Dental Practice, Bureau of Research & Economics, American Dental Association

Recommendation #1 - *It is recommended that the dental and dental auxiliary schools of this state, through the coordination of the Health Professions Education Advisory Council, formulate a state-wide plan for the sharing of clinical facilities so that dental and auxiliary students, during an appropriate state of their training programs, may as a team share common clinical learning experiences and thus develop a strong orientation to the concept of a team approach to dental care delivery.*

The resultant coordination of effort called for in the above recommendation, would in itself constitute a justifiable cause for the development of such a shared responsibility for the training of the dental health team. However, we further advocate that such steps be taken in order to correct instances of underutilization of clinical facilities in both the dental and dental auxiliary schools. Where functional clinical operatories exist (dental schools and most hygiene programs) dental students can work with either a hygiene student or dental assisting student (doing both traditional and expanded functions) as the various procedures permit. Presently each type of student is educated apart in their respective institutions or clinics. The proposed "doubling up" on the utilization of clinical space is viewed as being not only educationally sound (for students who have completed their fundamental training), but also would foster the maximum utilization of high cost facilities.

Recommendation #2 - *It is recommended that all dental auxiliary program directors work together in the development of core curricula and instructional modules which include expanded duties and which are designed to form a career ladder which offers accessibility to advancing students, returning auxiliary veterans and other health related personnel.*

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(4) The team approach as used in this context implies the working together of the dental health team for efficient delivery of services and not necessarily the utilization of expanded-duty auxiliaries.

This recommendation becomes particularly important as the dental and auxiliary schools begin to share their facilities and concomitantly design cooperative educational experiences for their students. The instructional bases for all schools involved in this team approach must be somewhat standardized, so that when students from different institutions come together in a clinical setting, they can work efficiently with one other in the delivery of the necessary health care. In developing instructional modules, attention also should be directed toward their utilization as continuing education packages which can serve to teach subjects, such as expanded functions, to presently practicing auxiliaries.

An example of the type of core curriculum and instructional modules which might be designed can be found in the UCLA Allied Health Professions Project. After compiling the results of a task analysis within the dental hygiene, dental assisting and dental laboratory technician fields their project staff identified eighteen instructional modules which encompassed all necessary curriculum content. The eighteen modules and their overlapping distribution are presented below.

Dental Auxiliary Curriculum Units

1. Orientation
    - 1.1 Survey and ethics of health field
    - 1.2 History and organization of dental sciences
2. Basic Laboratory
    - 2.1 Pouring and trimming of models
    - 2.2 Construction of custom trays
    - 2.3 Wax carving, investing, casting techniques
3. Anatomy
    - 3.1 Basic human biology
    - 3.2 Basic dental anatomy
    - 3.3 Oral anatomy
4. Basic Sciences
    - 4.1 Human biology
    - 4.2 Microbiology and asepsis
    - 4.3 Oral biology
5. X-Ray
    - 5.1 Creating and developing a latent image: dark-room techniques
    - 5.2 X-ray physics and safety factors
    - 5.3 Dental radiography
6. Dental Office Procedures
7. Basic Dental Assisting
    - 7.1 Identification and care of instruments
    - 7.2 Chairside techniques
    - 7.3 Care and maintenance of dental equipment
8. Dental health education
9. Chairside

10. Expanded functions of Dental Assistants *
11. Advanced pre-clinical basic sciences
12. Dental prophylaxis techniques
13. Preventive procedures
    13.1 Topical fluoride application
    13.2 Advanced functions for Dental Hygienists
14. Expanded functions for Dental Hygienists *
15. Full denture construction
16. Partial denture construction
17. Advanced gold lab procedures
18. Ceramics
    18.1 Porcelain
    18.2 Gold Porcelain bonded

These instructional units encompass concepts and skills required for performance in the entire dental auxiliary functional area. Individual curricula are assembled by selecting instructional units applying to each specific field. A graphic example of how these can be used in multiple programs in seen in Figure 1. Although many units are highly conceptual, as opposed to being task-oriented (the content of which is determined via a variety of input sources), the task analysis data help to determine placement of procedural instruction in core, sub-core or specific training areas.

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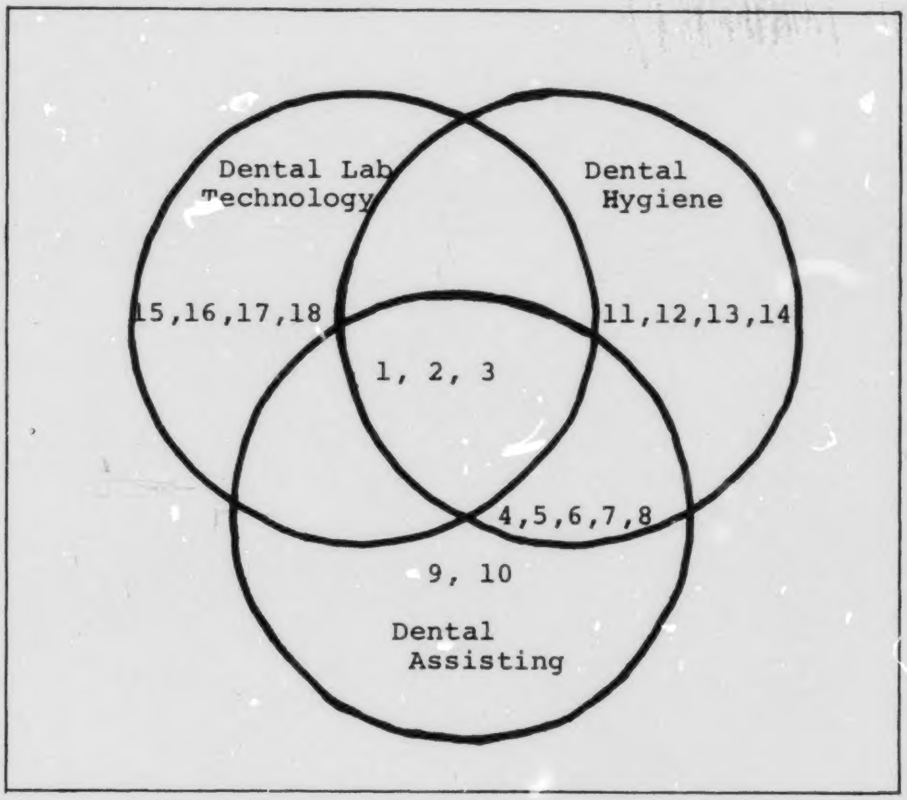
* Optional according to local needs and legislation

Figure 1 demonstrates that Units 1, 2, and 3 include the basic concepts common to all three Dental Auxiliary occupations. These constitute a sub-core curriculum for the dental field. Curriculum units 4, 5, 6, 7, and 8 provide the Dental Assistant and Dental Hygienist with common concepts relating equally to both curricula. Instructional units 9 through 18 contain specific concepts and skills applying only to the specialized duties of each occupation.

Figure 1 Common Use of Dental Auxiliary Curriculum Units



The type of overlap suggested shows how the three programs can be taught as a cluster within the same institution with the best utilization of resources.

If the program directors within this state become involved with the development of a similar core curriculum design, it would be necessary for them to identify the requisite instructional modules for each auxiliary program. They might then identify performance objectives for each of the modules within the following categories:

a) basic core objectives essential for all programs within the state.
b) desirable objectives which should be included if possible, and
c) elective or optional objectives

This classification would allow each school room for creativity and innovation within their program but would also provide the necessary degree of similarity necessary for the development of a training ladder. The task of developing a training ladder within the state is examined below.

In the dental hygiene field, a pathway can be developed from high school through hygiene training and on to expanded duty dental hygiene registration. Upon being accepted to a dental hygiene program within the state, students would begin the regular dental hygiene curriculum consisting of its present two years. A second possibility with a training ladder type of program would allow individuals who have completed their dental assisting training in an approved program to be eligible for some type of advanced placement when they enter the hygiene program. As a third example, it should be possible for auxiliaries with several years of training in the dental office to be similarly eligible for advanced placement in those hygiene courses where they can demonstrate proficiency.

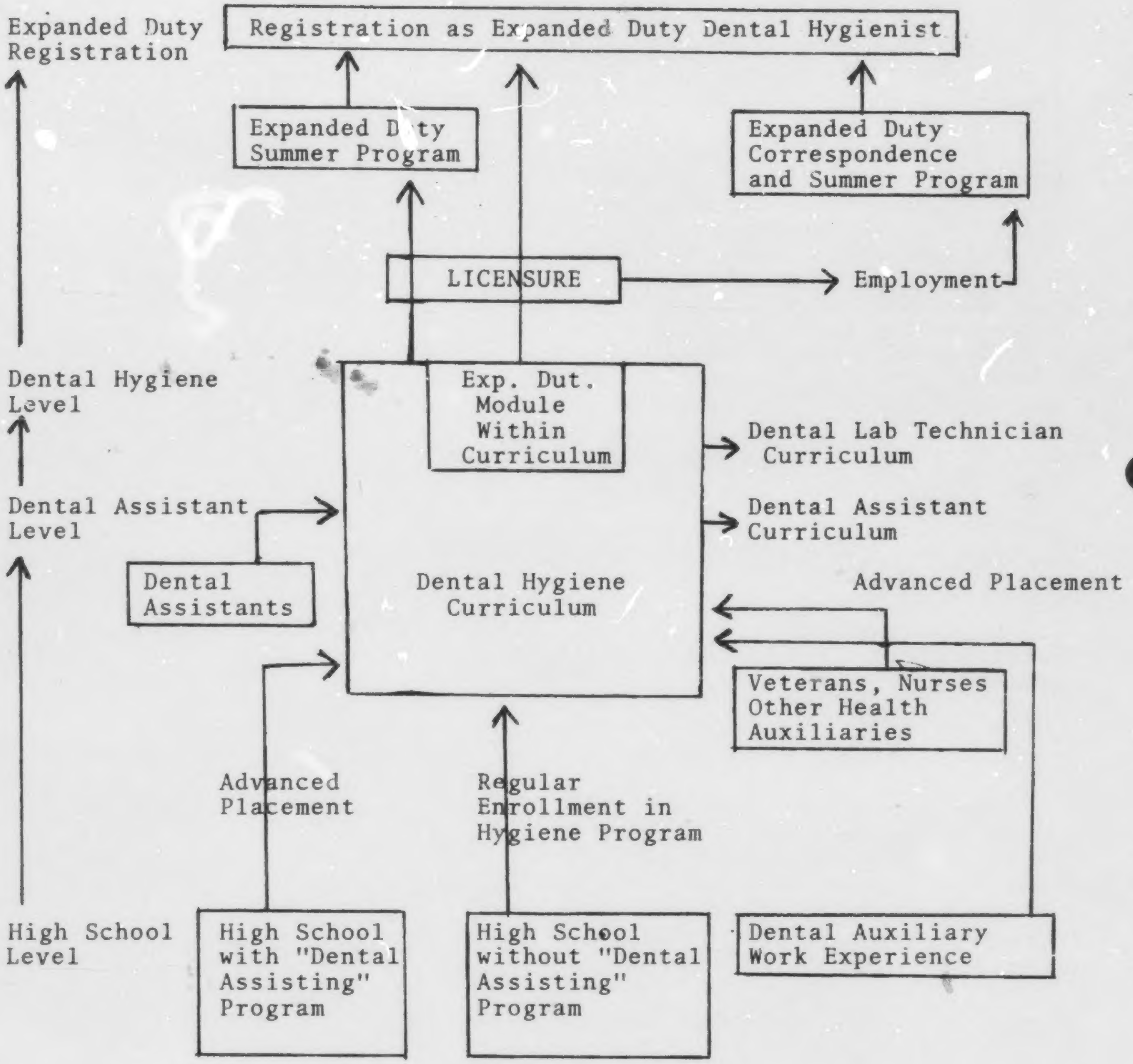
Upon completion of the hygiene program, students could be immediately registered for expanded duties if their particular hygiene program included the appropriate modules for the training of expanded duties. On the other hand, if their hygiene curriculum did not include such an expanded duties module, they could take a summer program for registration in expanded duties. An additional pathway should be developed through continuing education for hygienists who have been in the field for a number of years and would like to obtain registry as expanded duty dental hygienists. For these individuals, both a correspondence program and a summer program in expanded duties might be necessary for such registration.

An example of a dental hygiene career ladder which includes expanded duties is given in Figure 2. Similar pathways can be developed for dental assistants and dental laboratory technicians thus making making fullest use of the core curriculum designs and continuing education possibilities. The challenge of Recommendation #2 will hopefully lead to the design of a statewide dental auxiliary program matrix which will have as its guide a career improving training ladder.

Figure #2

CAREER LADDER FOR DENTAL HYGIENISTS

(including expanded duties)


Expanded Duty Registration
Registration as Expanded Duty Dental Hygienist
Expanded Duty Summer Program
Expanded Duty Correspondence and Summer Program
LICENSURE
Employment
Dental Hygiene Level
Exp. Dut. Module Within Curriculum
Dental Lab Technician Curriculum
Dental Assistant Level
Dental Assistant Curriculum
Dental Assistants
Dental Hygiene Curriculum
Advanced Placement
Veterans, Nurses Other Health Auxiliaries
Advanced Placement
Regular Enrollment in Hygiene Program
High School Level
High School with "Dental Assisting" Program
High School without "Dental Assisting" Program
Dental Auxiliary Work Experience

Recommendation #3 - *Dental and dental auxiliary schools should cooperatively develop experimental programs which include expanded functions. These institutions should work with the State's dental and auxiliary societies and the State Board of Dentistry in the development and introduction of legislation which will greatly increase the flexibility of the State's Dental Practice Act to include provisions for the delegation of supervised expanded functions to adequately trained and appropriately licensed hygienists.*

In order to guide all states in their development of new legislation which will permit the use of expanded functions auxiliaries under the supervision of a dentist, an Interagency Committee has recently compiled an extensive report which outlines those duties which, after appropriate education, can be performed by auxiliaries.(5) It is suggested that these guidelines be used by the State's dental profession in their development of new legislation and that our educational institutions also use them as a guide in designing high quality training programs which include the teaching of expanded functions. In addition to the development of this partnership among dental hygiene and assisting programs, each curriculum should be critically examined so that its content, direction and length are re-evaluated in light of the many social and professional changes which are currently taking place. With these two general guidelines in mind, we shall now specifically examine the interplay between education and manpower planning in the separate dental field occupational categories.

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(5) The Interagency Committee is composed of representatives from the American Association of Dental Examiners, American Association of Dental Schools, American Dental Assistants Association, American Dental Hygienists Association, Council on Dental Education, Council on Dental Laboratory Relations, National Association of Dental Laboratories, National Board of Certification, U.S. Public Health Service. Its complete report has been printed in the May 1972 issue of the Journal of the American Dental Association. In it clear definitions of expanded functions for hygienists and assistants are provided.

Dentists

In looking at the manpower projections within the dental professional complex, it is not entirely surprising to find that the second highest need for additional manpower, as evidenced by the HMDP projections, is in the field of dentistry itself.(6) For many years it has been shown that only 20% of the population seek regular dental care and only 40% of the population will see a dentist in any given year. When one compares this with the high levels of dental disease presently endemic to our population and the many apparent barriers to the receipt of adequate care, the considerable projected need gap, (given the passage of health insurance legislation covering dental care) is understandable.

The Health Manpower Data Project (Appendix E) made four projections for dental manpower. These four options are a combination of two supply projections coupled with two demand projections which result in the delineation of four alternative projections of the future dental manpower shortage. Of the two supply projections, the lower set of figures was selected since it was more reasonably indicative of recent 1966 - 1970 trends, as compared with older 1962-1966 figures, in the reflection of the magnitude of the net increase in the supply of licensed and practicing dentists in New Jersey. Of the two variations in demand figures, the smaller demand was chosen because it reflects the current philosophy of dental leaders in prescribing an increased use instead of auxiliary personnel, and to a greater extent than has been the case in the past in this State. Further supporting this choice of smaller demand is the pattern of national statistics which concur with this philosophy of dental education. Thus, the final projection chosen was a combination of the lower of the two supplies and the lower of the two demands.

These figures have been graphed on a statewide basis in Graph #1,(7) and a reasonable demand line drawn between the minimum and maximum national health insurance impact figures. The supply lines shows an upward "jog" in 1977 to reflect anticipated enrollment increases at the N.J. Dental School, reduced by the "in-state survival" factor discussed in the introductory section of this chapter.

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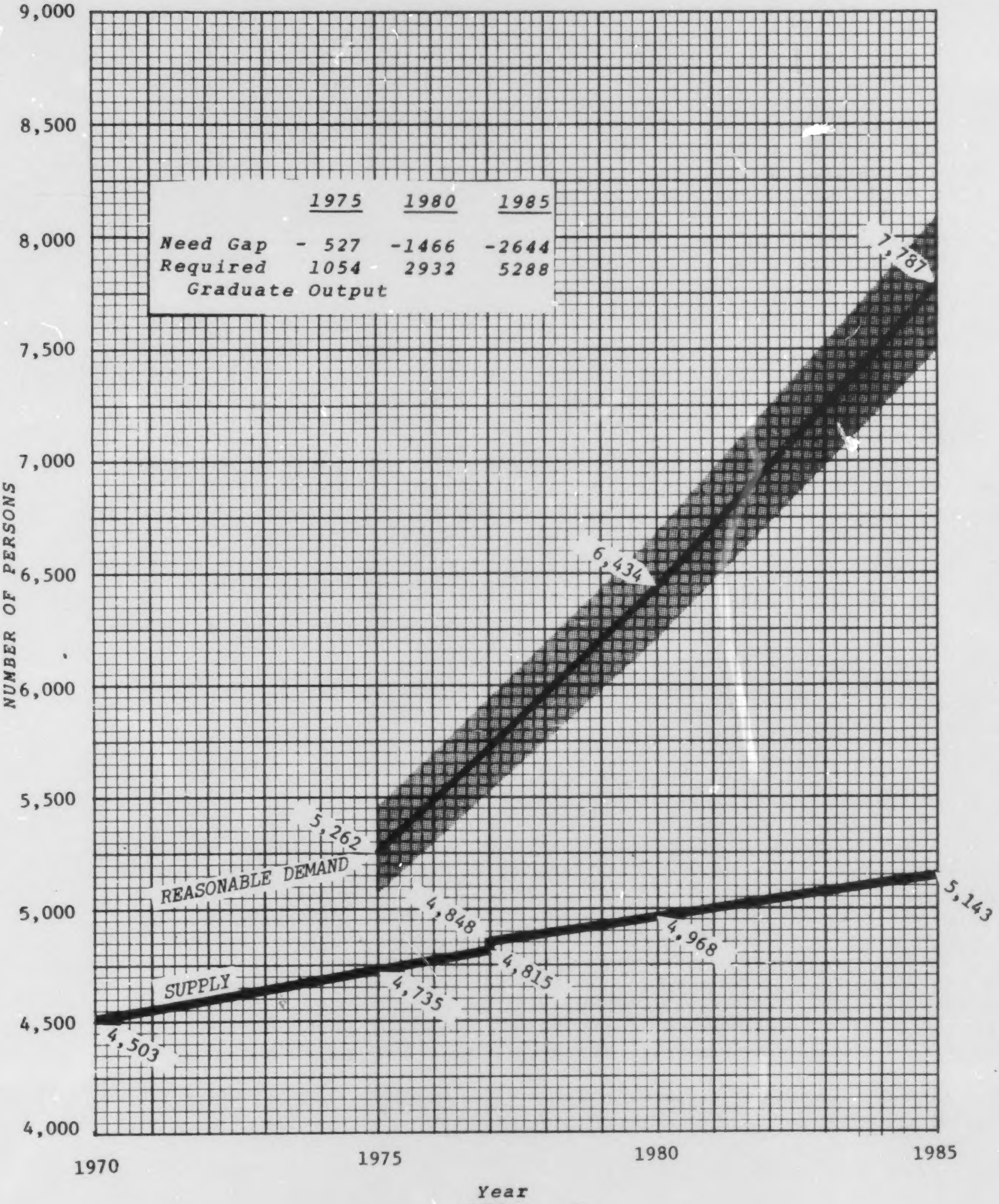
(6) At this time the dental specialties have not been separated from the manpower projections of the dental profession as a whole. This may be done in future revisions of the Health Professions Education Master Plan but at this time insufficient data is available for the development of dental specialties as separate sub-HMOCs.

(7) It is felt that this statewide scale is most appropriate as a planning unit since dentists are a highly mobile HMOC.

GRAPH #1

HMOC: Dentists

STATEWIDE BASIS



The final projection figures for dentists, it will be noted, form highly divergent demand and supply curves. This divergent situation is due to the reasonable demand line which rises by approximately 1,200 units the first five years after 1975, and 1,350 the second five years. Even with the inclusion of an expanded output in 1977, and with the assumption that the 1975 demand will be met (unlikely as it may be), the 1980 gap would still be even larger than the 1975 gap. The same will be true of the 1985 gap in relation to the previous five year period. The table which is inset on the graph not only documents this increasing need gap, but illustrates that in order to compensate for loss of graduates from New Jersey dental schools to other states (50 percent loss in the case of dentistry) an even more enormous disparity will exist between required graduate output and our current dental school capacity.

Increasing Supply and Reducing Demand -- Closing the Gap

The problems of supply and demand indicated by the large need gap in Graph 1 and its inset table, must each be addressed. We believe the supply could be raised somewhat higher than the HMDP projections, and the demand lowered significantly, if the State's dental schools were to examine and implement several actions, including:

a) Increasing the production of dental students;

b) Educating different types of practitioners;

c) Improving post-graduate options within the State;

d) Experimenting with the use of expanded function auxiliaries and alternate delivery patterns;

e) Improving continuing education opportunities within the State.

A. Increased Production of Dental Students

In response to federal incentives, dental schools throughout the country have greatly increased their enrollments in recent years. Within this State, the Fairleigh Dickinson University Dental School has recently moved into a new building and increased its enrollment from 50 to 83 per class. The New Jersey Dental School of the CMDNJ has increased its enrollment this past year from 55 to 64 entering students, and is implementing a compressed curriculum which fully utilizes its available facilities by enrolling students for three instead of four academic years. Construction of a larger facility in Newark and the introduction of semi-annual admission procedures will allow the N.J. Dental School to expand to a potential production of 128 graduates per year.

Significant enrollment increases beyond what has been projected are, for the present, acknowledged as unfeasible. Nevertheless, it is recommended that:

Recommendation #4 - Both dental schools within the State should examine their respective presently untapped possibilities for increasing their enrollments through the maximum utilization of facilities throughout the calendar year.

The above recommendation does not call for large additional enrollment increases at our two schools. The only alternative to expand enrollments, if any, would be in the creation of additional clinical facilities or perhaps a third dental school in areas remote from the present facilities. Looking at present federal construction priorities, it does not seem likely that any further expenditures will be allocated for this purpose. Within the past ten years, no new dental schools have been approved for construction but several have nonetheless experienced funding difficulties in recent years. Moreover, other state priorities, in higher education alone, would seem to indicate that planning for a third dental school within the State is premature. The shortage of dental manpower will therefore continue to exist unless other approaches than increasing the number of graduates are addressed. It is clear that significant improvements must be made in the performance capabilities and efficiency of our present and future manpower pool, or serious deficiencies in the quality and quantity of dental services in the State will ensue.

B. The Education of a Different Type of Dental Practitioner

Dental educators have been critically evaluating the content of their traditional curricula to ascertain if in fact dental education can be reduced in length and if the content could be altered to improve the final product. Substantial reductions in the curriculum's content have not taken place. The three-year curricula are usually four academic years of instruction compressed into three calendar years, although a number of possibilities are currently being explored nationally which would substantially alter traditional patterns of dental education. Some of these modifications are summarized below:

1. With an increasing amount of treatment now being delegated to trained auxiliaries, many dental educators see the primary role of the dentist as an oral diagnostician. The dentist, in this view, must become more proficient in relating basic science knowledge to the application of the clinical sciences, but this process is frustrated in traditional curricula where basic science education is concentrated in the first two years and the clinical sciences in the remaining two years. Hence, the integration of basic and clinical sciences within the dental school curricula is usually given first priority by these educators.

2. Simultaneously, another aspect of curriculum modification (which might lead to a reduction of total curricular time) centers on the possibility of removing some basic science courses such as microbiology and biochemistry from the present dental school curriculum altogether, and making them prerequisites for entrance into dental schools. This approach has the further benefit of thus allowing for the development of more sophisticated (and relevant) oral biology sequences within the curriculum.

3. As the dentist becomes more of a diagnostician other aspects of his education must also be altered. The addition of auxiliaries to his office or clinical environment necessitates the development of interpersonal skills which have previously been ignored. The dentist who utilizes an increased number of auxiliaries may also treat a larger number of patients, and in this awareness of the increasing complexities of the doctor/auxiliary/patient relationship, must become more skilled in such matters than in the past. As professionals have come to realize that their skill in motivating patients to maintain good oral health is dependent upon both their psychological and restorative capacities, the role of the behavioral sciences has assumed a more prominent role in the curriculum.

4. Some of the above psychological concerns have also been expanded to encompass the social concerns which the profession must have if it is to improve the willingness of the public to seek the care it requires. While it is true that many psychological barriers (fear of the dentist) must be overcome, there are also many sociological barriers to patient care to which the dental student also must become sensitive. Hence, consideration must be given to the inclusion of these disciplines in the basic dental curriculum.

The incorporation of the curricular modifications such as those identified above has considerable bearing on the level of future manpower needs. Such improvements in curricular philosophy and implementation also are seen as promoting improved dental care of the public. It is therefore recommended:

Recommendation #5 - The Dental Schools within the State must continue to re-examine their curricula and to make such revisions as will not only lead to further reductions in their length, but more importantly give emphasis to the enhanced socio-psychological role dentists should play in raising the public's consciousness and willingness to seek appropriate dental care.

C. Improving Graduate Education Options Within the State

It is known that among physicians, the attractiveness and satisfaction associated with the internship and residency experiences of recent medical school graduates is an important factor in their eventual establishment of practice within a given locale. It could be assumed that parallel factors exist for the location of recent dental graduates, but it is clear that the number of general practice internships available in hospitals or other health delivery settings does not match their high demand by such graduating students. However, increased acceptance of the concepts of comprehensive patient care and the interdisciplinary team approach to health care has influenced the creation of many new hospital-based internship programs.

The general attractiveness of these concepts and the further training opportunities which such experiences can provide, as well as the possible improvement they can contribute to the retention rate in New Jersey of our dental school graduates, encourages us to recommend that:

Recommendation #6 - The two dental schools, in cooperation with the New Jersey Hospital Association, should actively seek to create general practice and rotation internship possibilities for their graduates within those hospitals, neighborhood health organizations, health maintenance organizations, and other large clinics in which adequate facilities and educational experiences can be provided. If possible, such experiences also should be incorporated into the undergraduate dental curricula so that a broad learning environment is provided and the potential for the graduates' location within the State is enhanced.

Another form of graduate dental education which should be studied within the State is the desirability of improving the present graduate specialty programs (Periodontics, Oral Surgery, etc.) presently available at our two dental schools. As the development of such programs play a role both in maintaining a high quality undergraduate dental program, as well as providing additional opportunites for improving the supply of specialists within the State, it is recommended:

Recommendation #7 - The State's dental schools should develop a comprehensive long-range and appropriately staged strategy for the improvement and expansion of their graduate specialty programs.

D. Experimentation with Expanded Duties for Auxiliaries and Alternate Patterns of Delivery

The need for revision of the State's Dental Practice Act to include provision for the expanded function of dental auxiliaries was addressed in the introductory remarks on dental hygiene and dental assisting. The role of dental schools in helping to educate auxiliaries also is important, and should be one which permits their leadership and that of the auxiliary schools to develop reinforcing partnership arrangements towards that goal.

Dental Schools, since 1960, have received federal assistance for the training of their students in the basic concepts of auxiliary utilization emphasizing sit-downs,and four-handed dentistry. Funding for this approach is currently being replaced by a new federal program, Training for Expanded Auxiliary Management (TEAM). This program is designed to train dental students to manage a team of auxiliaries (including expanded function auxiliaries) in the efficient treatment of a larger patient load. In addition to this program, dental schools are encouraged to engage in applied research which would investigate possible delivery patterns which can be utilized by practicing dentists in their application of expanded function concepts. The composition of such dental teams could vary from one to several dentists using any number of auxiliaries. The most desirable combinations of dentists and their auxiliaries have yet to be clearly identified. It is therefore recommended:

Recommendation #8 - The State's dental schools should conduct demonstration programs which will train dental students to cooperate and function with both traditional and expanded duty auxiliaries, and simultaneously engage in an applied research analysis of the efficacy of alternate patterns of dental care delivery.

E. Improving Continuing Education Opportunities

By its very nature, a profession takes upon itself the responsibility for the continuing education of its members. In the past, continuing education efforts within the dental profession were probably adequate for the practitioner's needs. As with other aspects of dental education, however, future needs in this area are expected to greatly increase. The rapidity with which obsolescence can overtake yesterday's basic knowledge is apparent to all, particularly in the scientifically oriented professions.

The profession is presently using its continuing education procedures in an attempt to provide members with the opportunity to stay abreast of current trends. It is expected that the national movement toward the expansion of duties for auxiliaries will greatly increase the pressures on our present methods for providing continuing education experiences.

Not only will a number of presently practicing auxiliaries demand training in the expanded function concept via continuing education mechanisms, but those dentists who wish to utilize these auxiliaries will also want to improve their management skills through enrollment in comparable continuing education experiences. This future educational demand on the profession must be examined by both the dental schools and the dental society so that educational processes can be designed and validated as soon as possible.

There is also movement toward the organization of a formal continuing education process as a means of maintaining continued competence. A pilot program which will create a registry of all continuing education experiences for dentists in Minnesota and Kentucky, provides evidence of the feasibility of a state-wide approach to the development of a continuing education system. It is felt that both the dental schools and the dental societies have unique and complementary roles to play in the development of such a system. The societies are close to the pulse of their memberships' needs, while the schools in most cases possess both the expertise and the facilities required to provide the necessary programs. In order to bring these facilities as close to the practitioners and auxiliaries as possible, consideration also should be given to the possibility of using two year college campuses for clinically oriented programs.

Recommendation #9 - It is recommended that the two dental schools, the State dental societies, other auxiliary societies and the State Board of Dentistry cooperate in the development of a State-wide system of continuing education for both dental practitioners and their auxiliaries. A system of this type should be designed to maximally utilize the educational resources of both the dental and auxiliary schools.

It is entirely plausible to relate this continuing education effort to future dental manpower needs. The largest untapped resource for the improvement of dental services within the State are the presently practicing dentists. Many new and worthwhile concepts in the areas of dental practice management and auxiliary utilization have been introduced to the practice of dentistry only in the past several years. The large majority of the dentists who practice in New Jersey graduated at a time when many of these concepts were not proven and perhaps had not yet even been identified. Given the validity of these concepts for the more efficient deployment of our dental field personnel, and significant productivity changes could result from their informed acceptance by current practitioners.

Dental Hygienists

In many ways interpretation of manpower needs in the dental hygiene HMOC are quite confusing. In reviewing the HMDP projections one can be somewhat comforted by the fact that it seems the demand gap is not very great. Further investigation, however, reveals that this particular HMOC is in a state of flux throughout the nation and that perhaps the demand projections, even though they have taken into account the expanded utilization of auxiliaries, do not adequately reflect the potential increases which are needed and which should be aggressively implemented in the field of dental hygiene.

Much of the national controversy in the field of dental hygiene revolves about proposals for the creation of a new HMOC to be called the dental therapist. The 1971 Health Manpower Training Act specifically made reference to the training of such therapists but was vague in its description of who might become a therapist. In part this confusion has surrounded the term therapist since it was first introduced a number of years ago as the designation for a new expanded duty dental auxiliary. The functions that were assigned to this auxiliary included those which previously had been strictly defined as the sole responsibilities of the dentist. Procedures such as conducting preliminary oral examinations, taking of radiographs, making of the preliminary impression as well as the insertion, carving and polishing of amalgam, and plastic restorations were included among the possible duties of a therapist. Further confusion came when other terms such as techno-therapist, dental associate and dental nurse were also used to define similar versions of this expanded duty auxiliary.

This proliferation of titles, along with the existence of a variety of experimental auxiliary training programs being carried out throughout the country, and the recent widespread liberalization of dental practice act legislation regarding auxiliary functions, has led to a great deal of uncertainty within the dental community as to exactly what the future holds for the dental hygienist.

As will have been noted, it is the conclusion of this study that the duties of both the hygienists and dental assistants need to be greatly expanded within this state. At this time, for this reason, the creation of an additional auxiliary seems to be premature. Therefore, we recommend:

Recommendation #10- The development of the dental therapist HMOC should be postponed within this State and efforts should be concentrated on revising the present Dental Practice Act so that the functions which both dental hygienists and dental assistants can perform under the supervision of a dentist are expanded.

Although the dental therapist HMOC has not been examined in this preliminary draft of the master plan, it should be noted that the federal guidelines which list the expanded functions of a dental therapist closely parallel the discussion of expanded functions for dental hygienists included in the Report of the Inter-agency Committee on Dental Auxiliaries.(8) With specific reference to those expanded functions which can be competently performed by dental hygienists, the report states:

> "The following procedures traditionally have been performed only by the dentist and are considered examples of expanded functions for both dental assistants and dental hygienists: placement and removal of rubber dams; placement and removal of matrixes; placement and removal of temporary restorations; placement, carving, and finishing of amalgam restorations; placement and finishing of resin, composite, and silicate restorations; and administration of local anesthetic. In addition, removal of excess cement from coronal surfaces of teeth is included in this section of the guidelines."

The impact which the utilization of expanded duty auxiliaries could have on the future demand for dental care is indeed significant. If either the New Jersey Dental Association or the State Legislature find that the creation of an expanded duty dental auxiliary who is not hygienist is required (such as is the case in Michigan and Ohio) (9) the previous recommendation would not be in conflict with such a proposal. In line with earlier recommendations in the introduction of the dental manpower section, we therefore make these further recommendations:

Recommendation #11 - Presently accredited dental hygiene programs within the state should offer, in cooperation with the State's dental schools, experimental (pilot) programs which include the teaching of those expanded functions which the Inter-agency Committee on Dental Auxiliaries has recommended as being appropriate for delegation to dental hygienists. These programs should be developed with the help and guidance of the State's dental and auxiliary societies and the State Board of Dentistry.

Recommendation #12 - Presently accredited dental hygiene programs, in cooperation with the State's dental schools, should develop an instructional module of short (several months) duration which will enable presently practicing dental hygienists to return to school for a short period of time in order to become proficient in the performance of the above mentioned expanded duties.

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(8) Op. cit.

(9) This type of auxiliary in Michigan and Ohio is limited to the restorative rather than the preventative aspects of dentistry.

Consideration also should be given to the design of an instructional module which could accommodate hygienists who do not want to stop their jobs for the necessary curricular time, but who could participate in the program through various combinations of correspondence courses, on-th-job training, evening and weekend programs and perhaps short one or two week clinical training sessions as are necessary. The expanded duty module should be developed with the help and guidance of the State's dental and auxiliary societies and the State Board of Dentistry so that concomitant changes in the Dental Practice Act can be made which will allow for the registration of such auxiliaries and hence their legal utilization.

As these recommendations are implemented the employment possibilities for expanded function hygienists is expected to greatly increase. For this reason, the Department feels that the HMDP projections of demand for hygienists are considerably lower than might be expected.

State and Regional Manpower Projections

In order to create manpower projections more characteristic of anticipated future trends, we have adjusted the HMDP projections to more accurately reflect the shortages which are very likely to occur as more and more dentists hire auxiliaries who are trained in the performance of expanded functions. On the following pages, Graphs 2-6 therefore incorporate a ten percent increase in demand for hygienists as a not unreasonable increment to the HMDP projections. Both State and regional analyses are presented in recognition both of the mobility of dental hygienists and the multiple existence of training facilities in New Jersey. It will be seen in using this formula that on a statewide basis (Graph #2)453 additional hygienists are needed to close the supply and demand gap, and up to 566 graduates (see inset table) by 1975 to overcome the "in-state survival" factor. Comparable shortages are demonstrated in each of the regions. (10)

The form of the supply and reasonable demand curves is slightly divergent on the statewide projection as well as in each of the regions. If, for instance, we assume that the regional demand is met in 1975 and then re-approached every five years, the supply at the end of the five-year period remains close to the lower boundary of the "national health insurance band". As an example, closing the 1975 gap in the metropolitan region by 196 dental hygienists,leaves only a 35 unit lag in supply by 1980. The gaps for all the five-year reappraisal periods are tabulated on each of the graphs along with their corresponding required graduate output.

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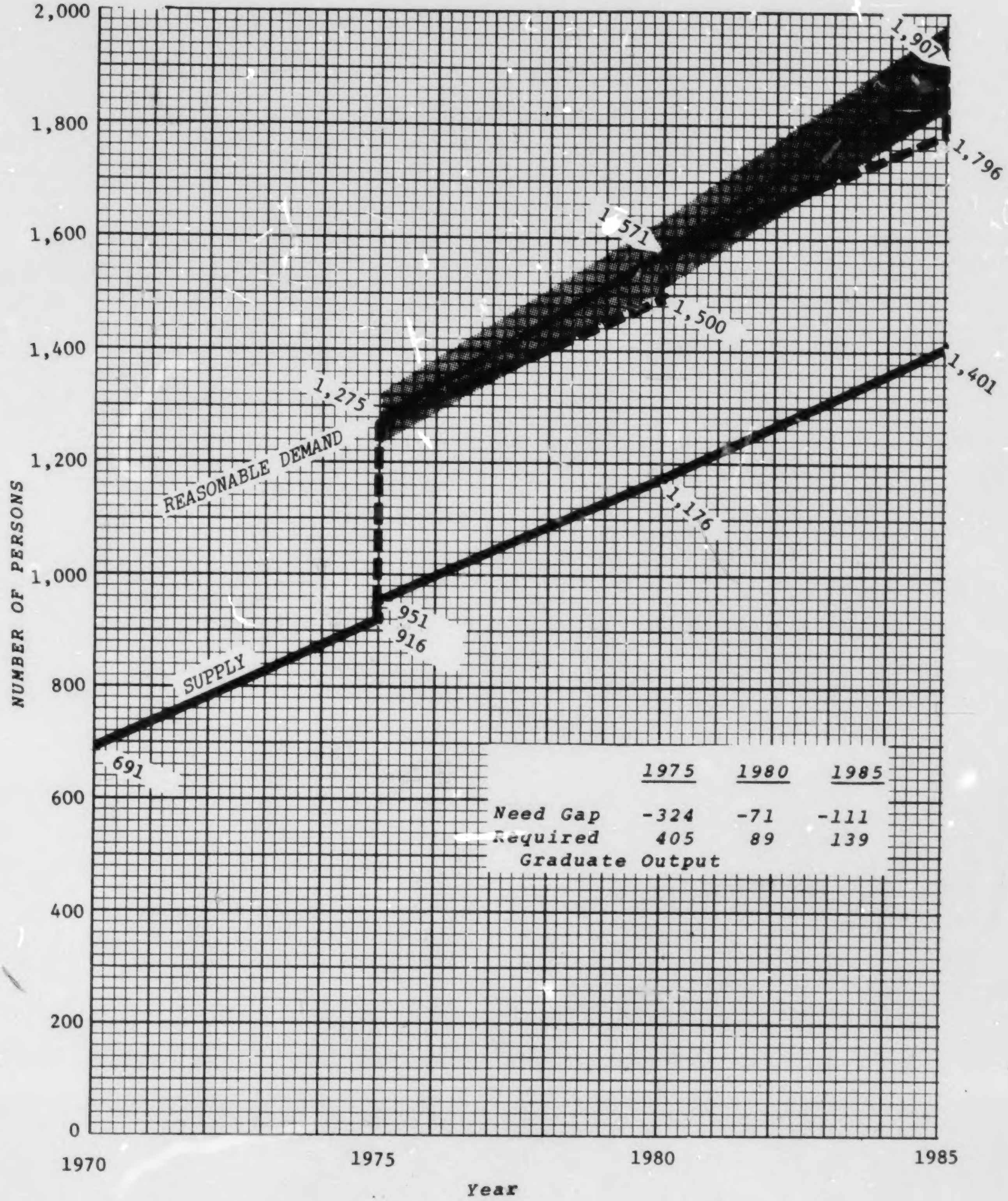
(10) Note that where applicable, the supply lines reflect increments resulting from dental hygiene programs approved by the Board of Higher Education since 1970. As explained in the introductory portion of this chapter, the number of anticipated graduates from these new programs has been factored by the 80 percent "in-state survival" rate assumed to prevail in this field.

GRAPH #2

HMOC: Dental Hygienists

STATEWIDE BASIS

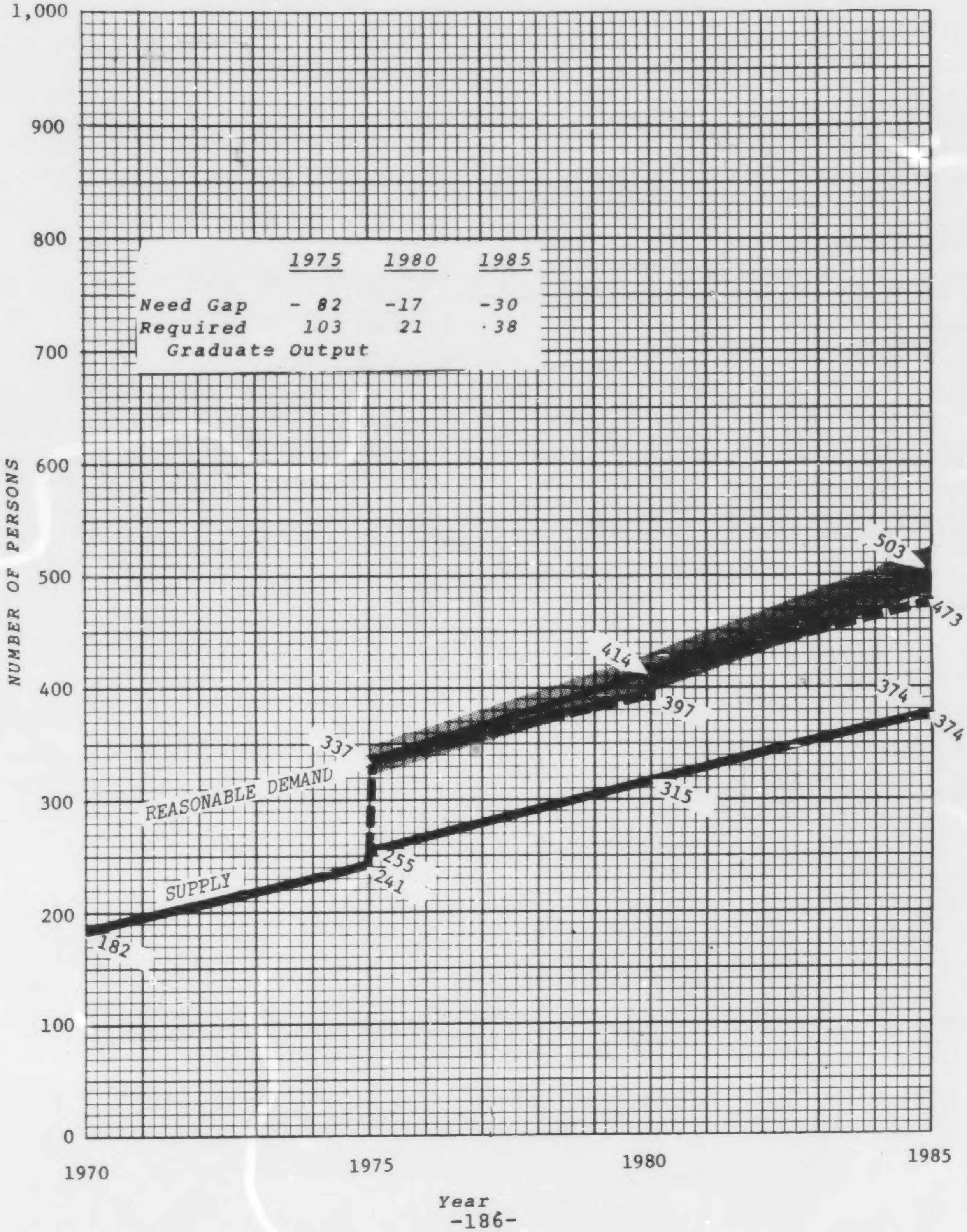


	1975	1980	1985
Need Gap	-324	-71	-111
Required Graduate Output	405	89	139

GRAPH #3

HMOC: Dental Hygienists

AREA 1

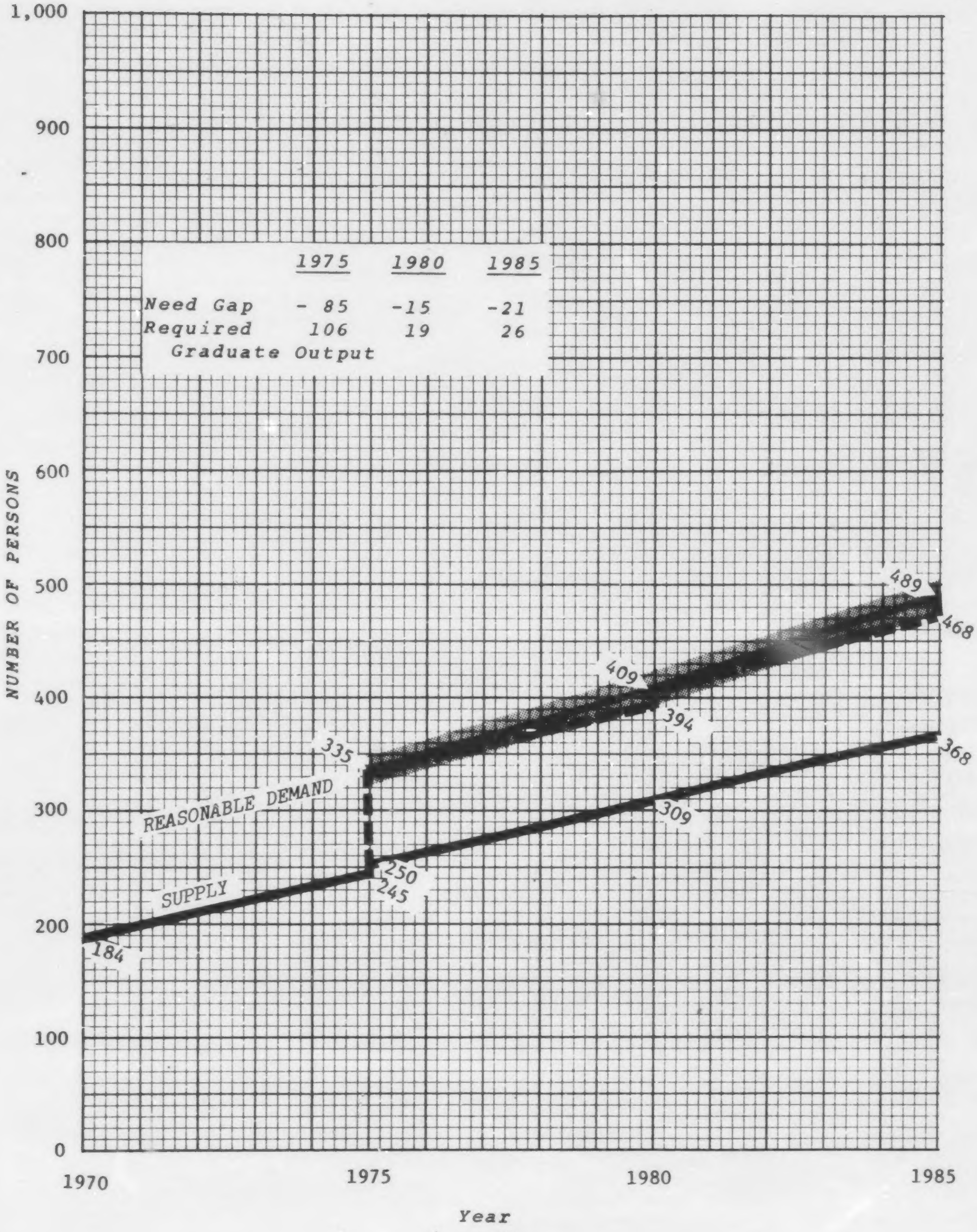


	1975	1980	1985
Need Gap	- 82	-17	-30
Required Graduate Output	103	21	38

GRAPH #4

HMOC: Dental Hygienists

AREA 2

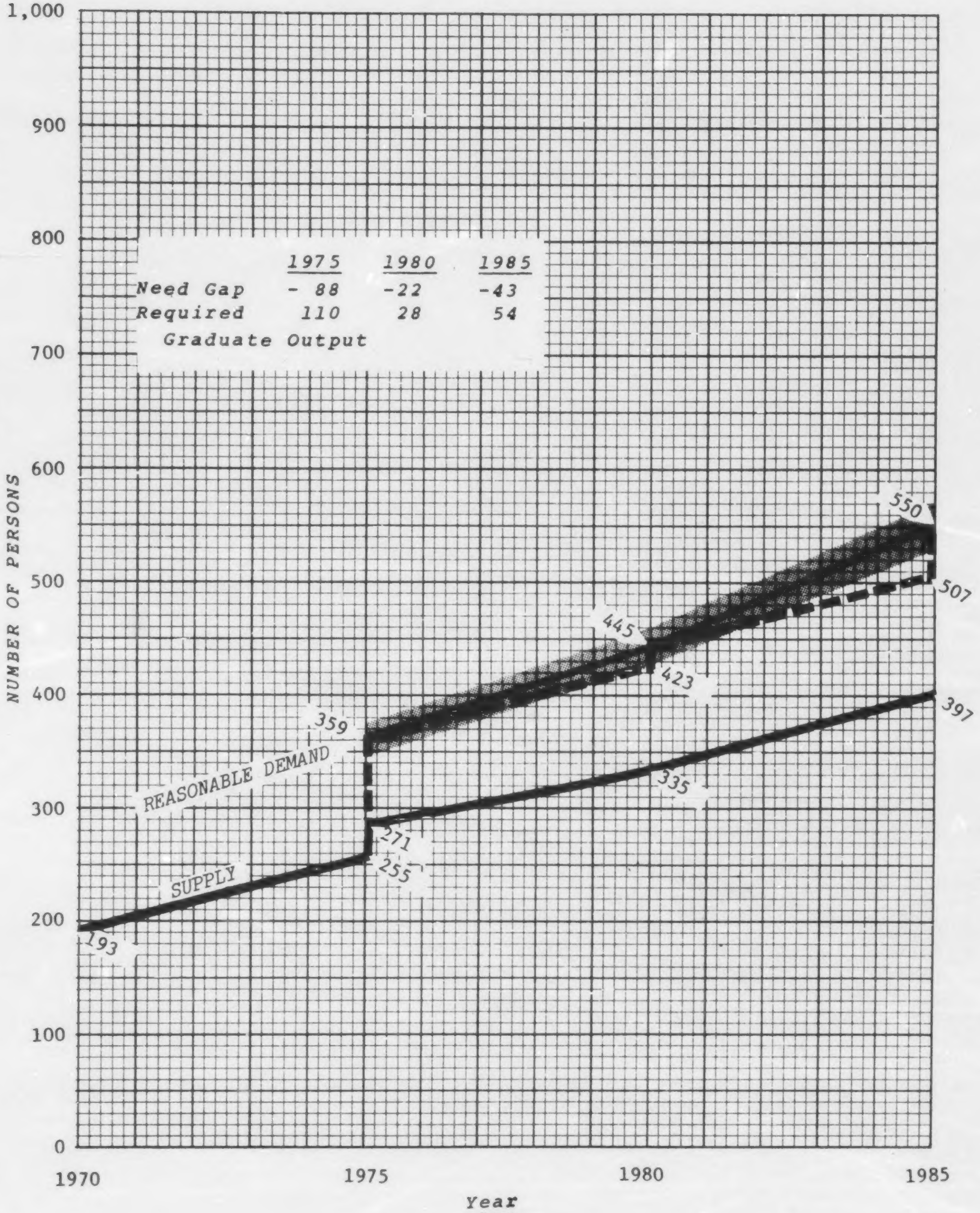


	1975	1980	1985
Need Gap	- 85	-15	-21
Required Graduate Output	106	19	26

GRAPH #5

HMOC: Dental Hygienists

AREA 3

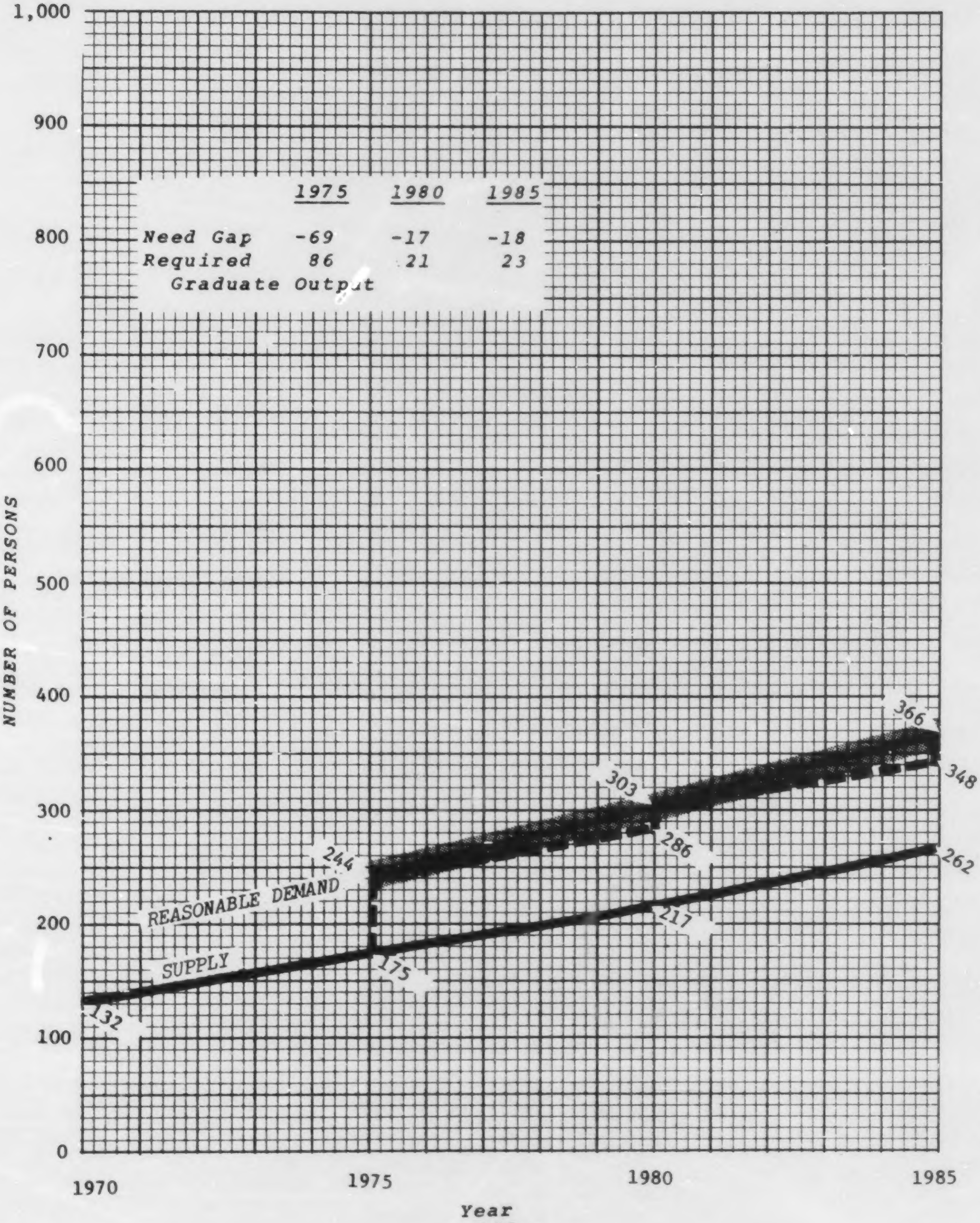


	1975	1980	1985
Need Gap	- 88	-22	-43
Required Graduate Output	110	28	54

GRAPH #6

HMOC: Dental Hygienists

AREA 4



	1975	1980	1985
Need Gap	-69	-17	-18
Required Graduate Output	86	21	23

Closing the Manpower Gap

With such dramatic shortages in this HMOC, a bold approach to the solution of this manpower problem is demanded. The obvious solution, which would entail the creation of new dental hygiene programs, is encouraged although such development should be carried out with due consideration of regional needs and the distribution of existing programs. As this process inevitably takes several years, a more immediate solution also is indicated. Those institutions which presently educate hygienists should plan for extensive increases in their enrollments. College facilities could be utilized to a greater extent by programming year-round use of their clinical laboratories, as well as increasing available clinic time (and hence class size) by extending clinic periods into the late afternoon and evenings. A third alternative has been anticipated in Recommendation #1 in this general section on dental health personnel, wherein it is suggested that auxiliary and dental schools fully realize their capacity for teaching two students (a dental and an auxiliary student) in the available clinical operatories within each institution. The development of a viable dental health team will be dependent on the ability of our collegiate institutions for both cooperation and efficiency in the training of their students. It has been stated earlier that no dental student should be trained in isolation from either a hygienist or an assistant and similarly no auxiliary should be trained without the final portion of that training being done at chairside with an experienced dentist or capable dental student.(11) It is therefore recommended:

Recommendation #13 -

a - New dental hygiene programs should be initiated following appropriate consultation with resource persons from the State's dental schools and where regional demand and institutional responsibilities support such an initiative.

b - Where feasible, present dental hygiene programs should seek means of expanding their enrollments through improved utilization of their facilities, and/or the sharing of clinical facilities with the two schools of dentistry, thus affording additional opportunities for increased hygiene student enrollments in the two year colleges.

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(11) We are not excluding the possibility of a two year college using local dentists to help in the staffing of a clinic in which expanded functions were being performed by auxiliaries. However, the more desirable situation, educationally, would be to have both advanced dental and auxiliary students who are proficient in their separate tasks (not the blind leading the blind), learning to work together in their natural chairside configurations.

Finally, in addition to the previous recommendations, it is believed that:

Recommendation #14 - The directors of the dental hygiene programs should jointly and continually analyze the content and length of their programs. The thrust of this examination should be directed not only to an assessment of the curricular underpinnings of the hygienists' traditional role in private practice, but also to their assumption of duties in hospital, school and other public health settings.

Dental Assistants

Although no data or projections were compiled in the HMDP for the dental assistant HMOC, it is essential that this occupational category be addressed in this discussion on dental health personnel. The important role of the trained dental assistant as a member of the dental health delivery team cannot be overlooked. Assuming the profession's desire for increased efficiency the demand for well-trained chairside assistants, who are proficient in the skills of four-handed dentistry and knowledgeable in the various specialty procedures, is very likely to be acute. In addition to this demand, many adjacent states have liberalized their dental practice acts to allow certain intra-oral expanded functions to be performed by adequately trained and supervised dental assistants. Future demand for competent chairside assistants who can perform expanded functions will provide a new challenge for both our educational institutions and our continuing education capabilities. The rest of this section examines some of the implications of this demand.

Dental Assisting Education

The recommendation made in the introduction to the section on dental manpower which relates to the development of joint programs apply also to this HMOC. The possibility of rotating through a dental school those dental assistants who have had their basic training in a high school vocational school or community college setting, is seen as an important part of their overall training. Dental assisting students should be oriented to the dental specialty areas of practice within the dental school, and to the team concept of dental care delivery also available in that setting.

Furthermore, as the demand for assistants who are proficient in the areas of patient motivation and oral health instruction increases in response to changes in duty delegation among auxiliaries, there will be an increasing need for dental assisting programs concentrating on treatment-centered contact with patients. These requisites can again be readily provided in the dental school environment. It is therefore recommended that:

Recommendation #15 - Directors of dental assisting programs and appropriate resource persons from each dental school should develop programs and affiliations which would meet the following requirements:

a - That new dental assisting programs be initiated following appropriate consultation with the State's dental schools wherever regional demand and institutional capabilities support such initiatives.

b - Where feasible present dental assisting programs should seek means of expanding their enrollments through improved utilization of their facilities, and/or the sharing of clinical facilities with the two schools of dentistry.

c - That program directors examine the other aspects of their curricula, including their length and content, to insure they will support future activity of their graduates in dental care settings beyond the traditional solo practice environment.

Differentiation of Occupations - Initiating a Ladder

Dental assistants, historically, have been trained on the job. In recent years with the growth of career occupational programs within our rapidly expanding community colleges, a number of dental assisting training programs have been launched in that setting. These programs, similar to dental and dental hygiene programs, are accredited by the American Dental Association's Council on Dental Education, and have usually been established as one academic year in length. Upon graduation from an accredited program, dental assistants may be credentialed by the ADA's Council on Certification entitling them to bear the title Certified Dental Assistant (CDA).

In addition to one-year programs, a number of community colleges operate accredited two year programs. In some schools, students who complete the first year are eligible for certification while those who stay on usually concentrate on liberal arts programs in order to earn an Associate Degree. Two-year programs vary considerably, however, in their design and objectives and at this time there seems to be no coordination among schools who have or are contemplating these types of programs.

Many other dental auxiliary programs are conducted within the state. These programs are located in community colleges, post-secondary vocational schools, proprietary schools and, more recently, vocationally-oriented high schools. The programs which are offered range from a short-term (several months) medical-dental secretary to shortened dental assisting programs (hence their non-accreditation) and dental assisting programs at the high school level which are considered to be of a high enough quality so as to be accredited. At the present time, however, the Council on Dental Education does not recognize high school level programs. More importantly, the above outlined extraordinary proliferation of educational programs and consequent job responsibilities in the dental assisting field is not conducive to either good educational processes, ladder principles or sound health practice.

In our assessment of the Dental Assistant HMOC we feel obligated to examine the different levels of dental assistant training noted above and to build upon the strengths which each type of program has to offer. We recognize a need for those auxiliaries who possess a general knowledge of office and secretarial procedures as well as a need for clinically proficient assistants. The problem of coordinating the programs of the many different schools, while not an easy task, must be attempted if the profession wishes to offer auxiliaries attractive work options and training ladder opportunities. A differentiation must be made between the various levels of education and proficiency which programs offer and each one should be designed to achieve the objectives for a given level while providing appropriate articulation (ladder) opportunities for their graduates. Therefore we recommend that:

Recommendation #16 - Directors of dental auxiliary programs (medical dental secretary up to two-year assisting programs) jointly develop a training ladder which will provide:

a - Advanced placement opportunities at the vocational or community college level for graduates of high school dental auxiliary programs.

b - Appropriate continuing education opportunities for presently practicing dental assistants.

c - Articulation with advanced placement opportunities in dental hygiene programs.

It is suggested that the ladder begin with medical/dental secretaries, then provide for advanced placement of high school (or other non-certificate) programs into the appropriate level of a certification program. This plan would require all dental auxiliary programs below the certification level to design their curriculum so that students accomplish a certain fraction of the tasks required for proficiency with the remainder to be done within a certificate level program.

A further suggestion which might be incorporated into the proposed training ladder would be the assurance that the first year of the two-year programs would prepare the student for certification in case a student wishes to become employed after only one year's study. The second year could include advanced dental assistant training in the various specialties, a program to develop office managers, or simply liberal arts requirements for the Associate Degree. Some consideration should also be given to continuing education programs and advance placement into dental hygiene programs. This latter task will only be successful if all levels of the ladder are thoroughly demarcated by terminal performance objectives which accurately state what tasks a graduate can perform. The degree of overlap in the objectives of two programs will determine the correct status of the student who is seeking advanced placement.

The career ladder which has been suggested (including possible expanded duty training) is outlined in Figure #3 on page 194.

While this may not be the training ladder upon which educators and the professional societies agree, it is offered as a starting point from which deliberations may proceed. As was suggested earlier in this section, representatives from the auxiliary schools, dental schools, professional societies and State Board of Dentistry should all be involved in the intensive discussions which will elaborate the most appropriate training ladder.

Registration for Intra-oral Expanded Functions

The Inter-agency Committee report, referred to in the previous discussion on dental hygiene, also elaborates on a number of intra-oral expanded functions which can be performed (after appropriate training) by dental assistants. The report states:

> "The following four procedures are not expanded functions for dental hygienists: preliminary oral examination, polishing of teeth, oral health instruction, and application of anticariogenic agents topically. These procedures traditionally have been taught in dental hygiene curriculums and have been performed by dental hygienists. However, they are expanded functions for dental assistants."(12)

The report further indicates that these:

> "examples of expanded functions in the Committee's opinion, should be taught in continuing education programs or in accredited dental auxiliary assisting education programs, provided the specified resources are available."(13)

While the above can be taught in both formal dental assisting programs and in continuing education courses, the report goes on to specify additional expanded functions which can only be taught to both assistants and hygienists in accredited educational programs which have both adequate faculty resources and appropriate facilities.

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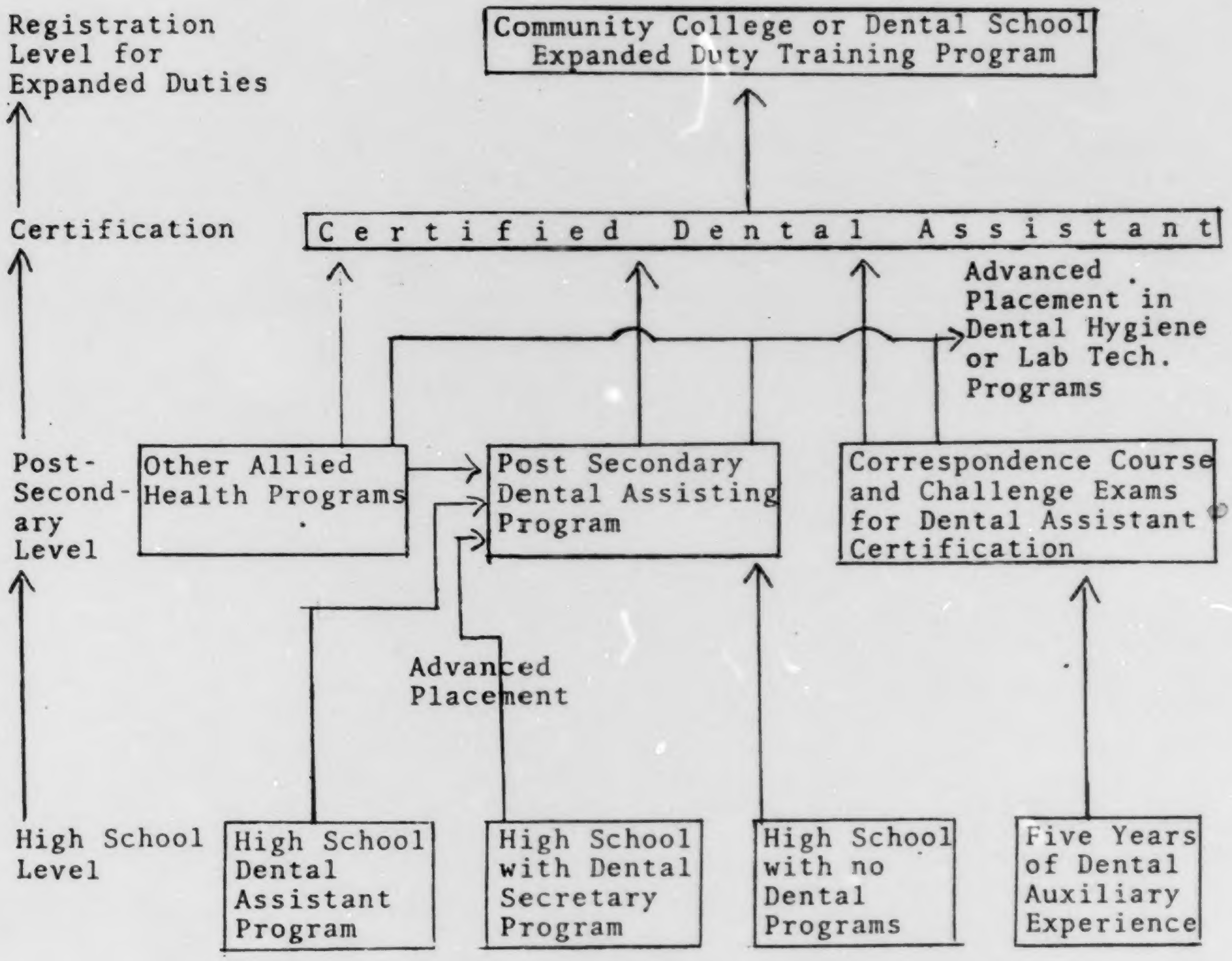
(12) Op. cit.
(13) Ibid.

Figure #3

DENTAL ASSISTANT CAREER LADDER PATHWAYS

(Including Expanded Duties)


Registration Level for Expanded Duties
Certification
Post-Secondary Level
High School Level
Community College or Dental School Expanded Duty Training Program
Certified Dental Assistant
Advanced Placement in Dental Hygiene or Lab Tech. Programs
Other Allied Health Programs
Post Secondary Dental Assisting Program
Correspondence Course and Challenge Exams for Dental Assistant Certification
Advanced Placement
High School Dental Assistant Program
High School with Dental Secretary Program
High School with no Dental Programs
Five Years of Dental Auxiliary Experience

It was clearly stated in the introduction to this section on dental manpower that the dental health team must become more efficient in its delivery of dental care. Both the dental hygienist and the dental assistant can be utilized more efficiently if they are allowed to perform expanded functions. We therefore recommend that:

Recommendation #17 - *Presently accredited dental assisting programs, in cooperation with the State's dental schools, professional societies and the State Board of Dentistry, should develop continuing education sequences which will enable certified dental assistants to be trained in those expanded functions which can appropriately be learned in a continuing education program, and;*

Such continuing education sequences should eventually be incorporated into existing curricula for new students while the continuing education programs would provide an educational opportunity for practicing dental assistants. An alternative method of developing expanded duty programs is recommended below:

Recommendation #18 - *Presently accredited dental assisting programs within the State should offer, in cooperation with the two dental schools, experimental (pilot) programs which include the teaching of those expanded functions which the Inter-agency Committee has recommended as being appropriate for delegation to certified dental assistants. These programs should be developed with the help and guidance of the state's dental and auxiliary societies and the State Board of Dentistry.*

These recommendations are based on the conclusion that the baseline for delegation of expanded functions to dental assistants will be the Certified Dental Assistant.

Challenge Examinations for Certification and Advanced Placement Ladders

The necessity for establishing a nationally recognized baseline upon which expanded functions can be built and still provide assurances of high quality service, may place a burden on the large number of presently practicing dental assistants who might wish to become certified. In addition, the desire to develop a workable training ladder should also allow presently practicing but uncertified dental assistants to easily enroll in educational programs which will upgrade their abilities and enable them to become certified. For these reasons it is important that we indicate that uncertified assistants who do not want to leave their jobs to obtain this upgrading can now enroll in an accredited correspondence program leading to certification which has been developed in North Carolina.(14) In place of taking each of the seven different correspondence course sequences in this program, an experienced assistant who has been employed for a minimum of five years can pass any or all of the courses by taking equivalency examinations. If these exams are passed, students are awarded institutional certificates from North Carolina and can then sit for their Certified Dental Assistant's examination. Thus a mechanism currently exists whereby interested assistants can become CDA's without leaving their current jobs for the necessary educational experiences. If certification does become the baseline for allowing assistants to perform expanded duties this mechanism will be helpful to those assistants who are interested in expanded functions.

As was pointed out earlier, an important factor in the development of a training ladder is the ability to accept students in more advanced programs with the appropriate advanced standing. Challenge (or equivalency) examinations are also an excellent means of establishing a student's level of comprehension and competence so that students with work experience, or uncertain educational background (e.g. a student from out of state or different allied health field) can be placed at an appropriate level. In order that the training ladder concept be facilitated, it is recommended that:

Recommendation #19 - The state's dental and dental auxiliary educators develop equivalency or challenge examinations based on the North Carolina format which could be used throughout the state for testing interested candidates for placement in the dental auxiliary training ladder.

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(14) Information pertaining to the North Carolina dental assisting correspondence courses and equivalency exams can be obtained from the University of North Carolina School of Dentistry or the American Dental Assistants Association.

Dental Laboratory Technician

The HMDP supplied two projections of dental laboratory technicians (see Appendix E, pp. 130-134, as well as Section 4, Charts 10 and 12, pp. 72-85 respectively). Paralleling the decision in the dental hygienists HMOC, the larger of the two projections was selected as the most probable future outcome. The rationale behind this choice is that both the philosophy of dental care delivery and the actual trends indicate increased use of auxiliary personnel. The dental laboratory technicians were also projected on a regional basis both because of their low mobility, and in acknowledgement of the present existence of programs in two of the regions (metropolitan and southern). Further, it is anticipated that significant differences in the magnitudes of demand among the regions are likely to remain over a period of years.

This decision to project dental laboratory technicians on a regional basis necessitated our further approximation of supply and demand in three of the regions since the HMDP could provide breakdowns for only eleven of the counties. To arrive at the regional shares of the statewide total, the demand and supply for the other ten counties was allocated by rationing the sum of demand and supply proportionately on the basis of 1970 Census Bureau county population data. It is assumed that the resultant distribution roughly approximates the distribution criterion in the eleven counties specified by the HMDP.

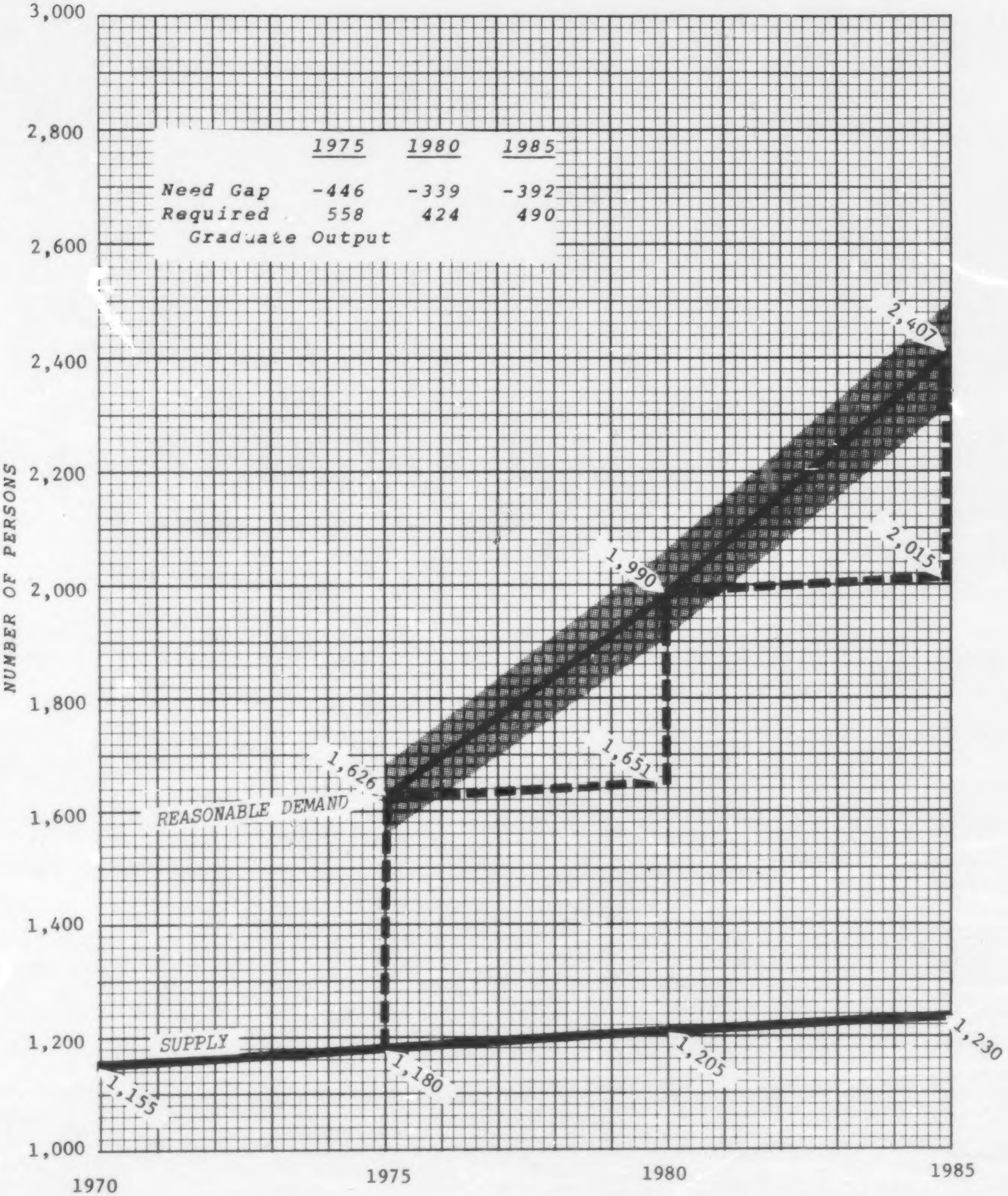
As will be noted from Graphs 7-11 on the following pages, in this HMOC the supply and reasonable demand curves are characterized as being strongly divergent on both the state and regional scale. On the statewide scale, the initial 1975 gap is approximately one third of that year's projected supply. Once adjusted for the "in-state survival" factor, and the number of graduates required to close the gap is almost one half the projected 1975 supply. Even if five-year readjustments are assumed, the future need gaps herald only slightly reduced shortages due to the steep slope with which the demand curve climbs. This strong divergency exists in each of the regions, but most significantly in the regions with the largest populations, the metropolitan and central.

From this analysis, it can be seen that in the future there will be a substantial shortage of dental laboratory technicians. There exist relatively few accredited laboratory technician programs in the nation as a whole; it is somewhat difficult to predict what future trends in their development might bring. Discussions also have begun nationally which are exploring the possibilities of an expanded function role for these dental auxiliaries as well as those previously discussed.

GRAPH #7

HMOC: Dental Laboratory Technicians

STATEWIDE BASIS

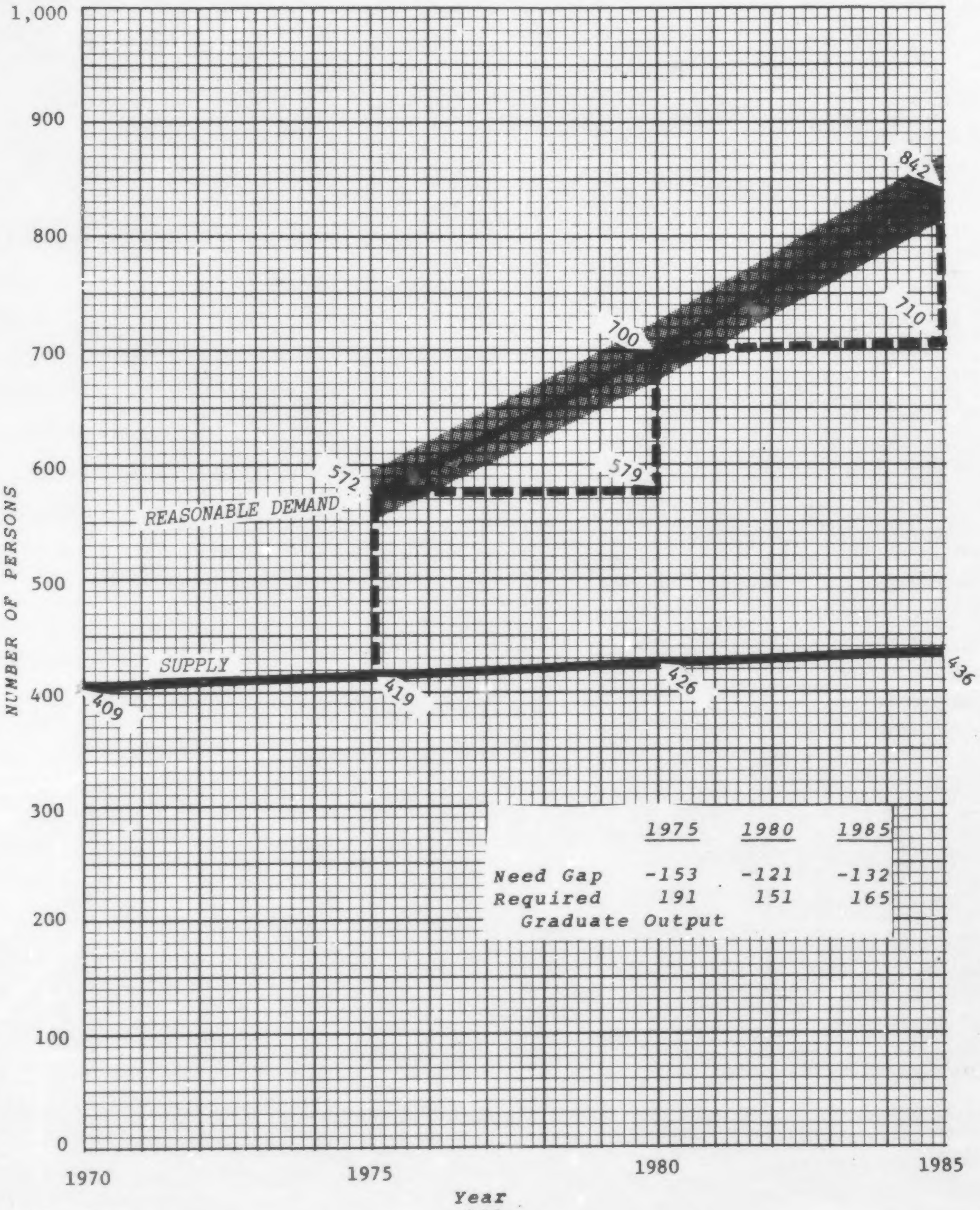


	1975	1980	1985
Need Gap	-446	-339	-392
Required Graduate Output	558	424	490

GRAPH # 8

HMOC: Dental Laboratory
Technicians

AREA 1

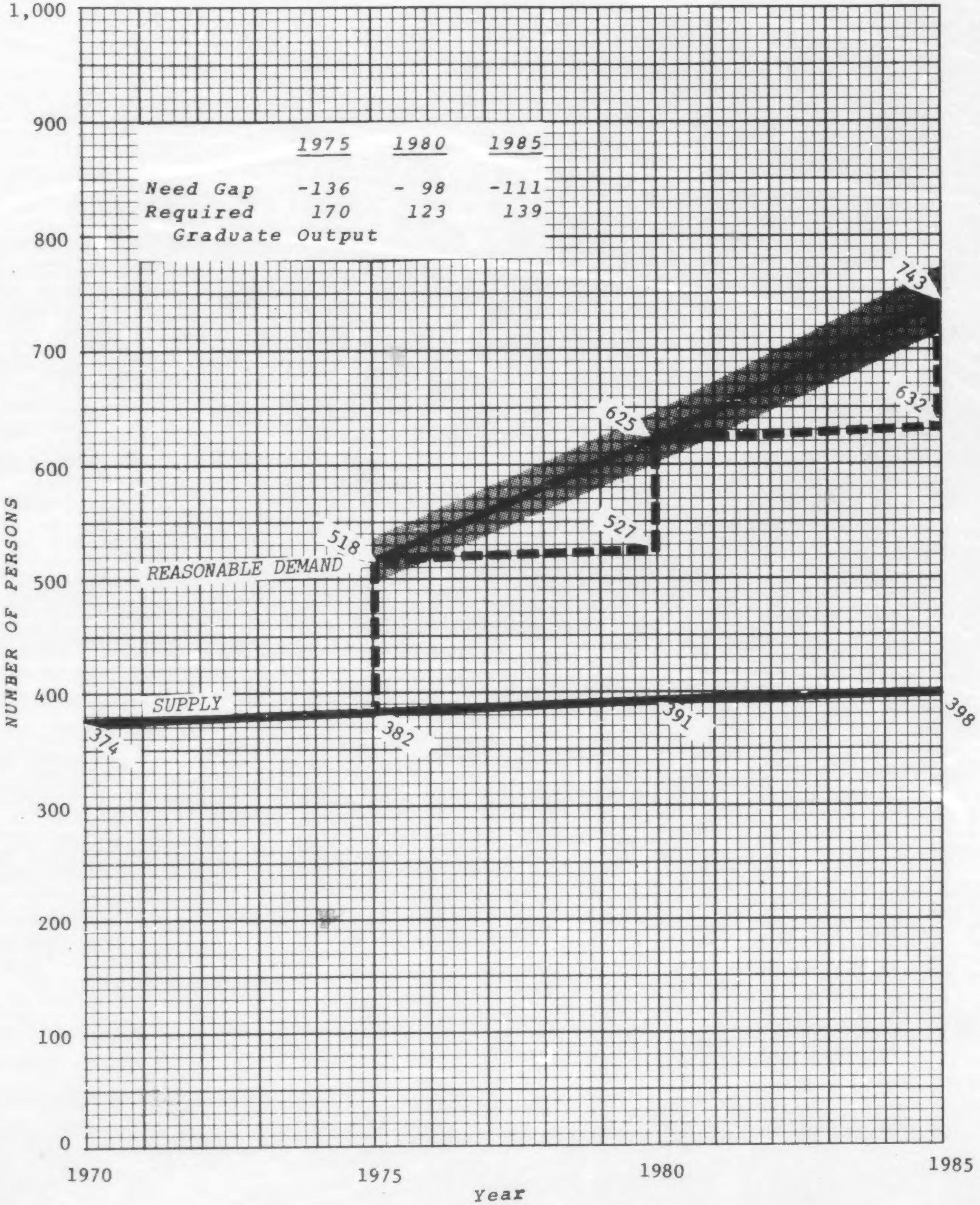


	1975	1980	1985
Need Gap	-153	-121	-132
Required Graduate Output	191	151	165

GRAPH #9

HMOC: Dental Laboratory Technicians

AREA 2

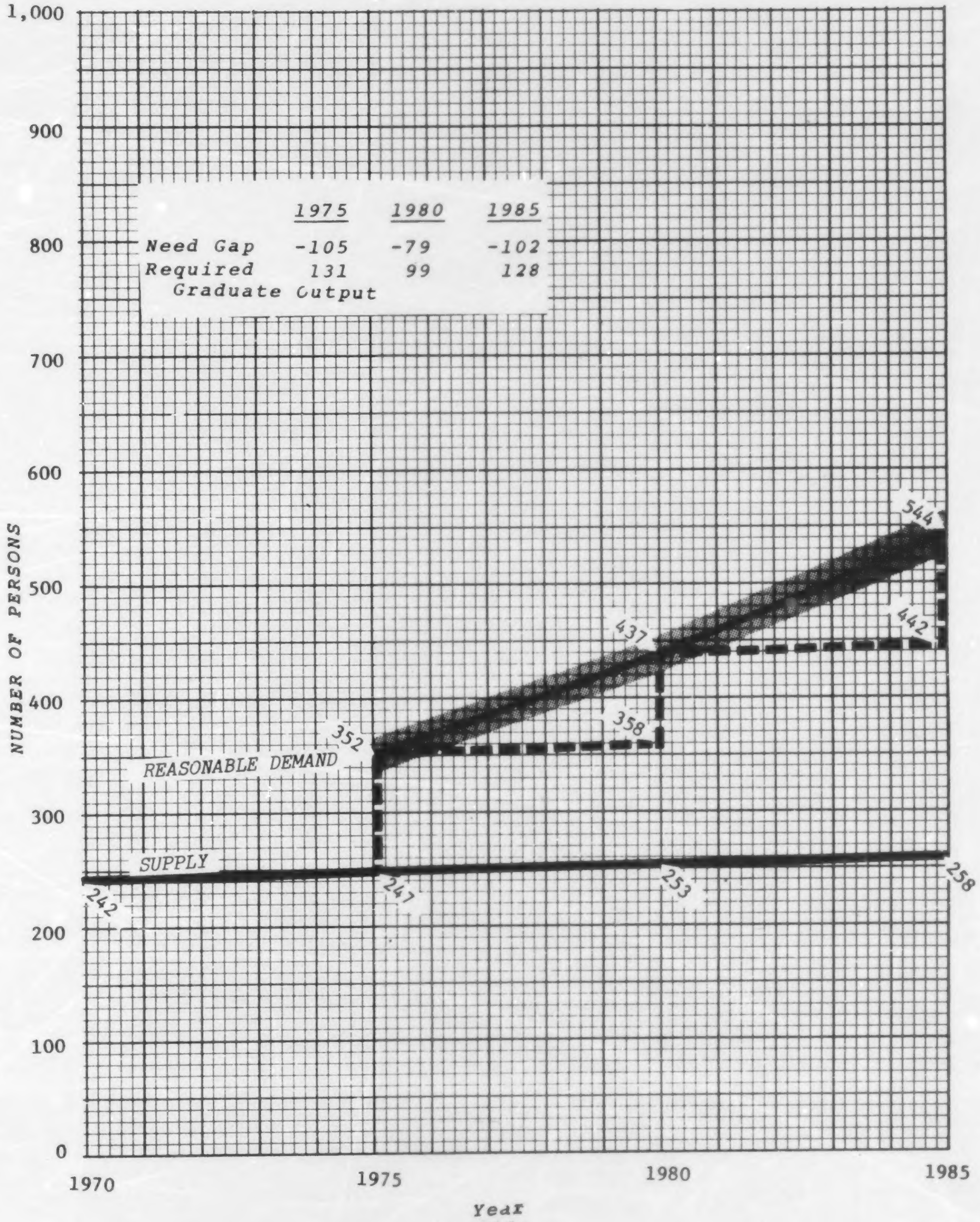


	1975	1980	1985
Need Gap	-136	- 98	-111
Required Graduate Output	170	123	139

GRAPH #10

HMOC: Dental Laboratory Technicians

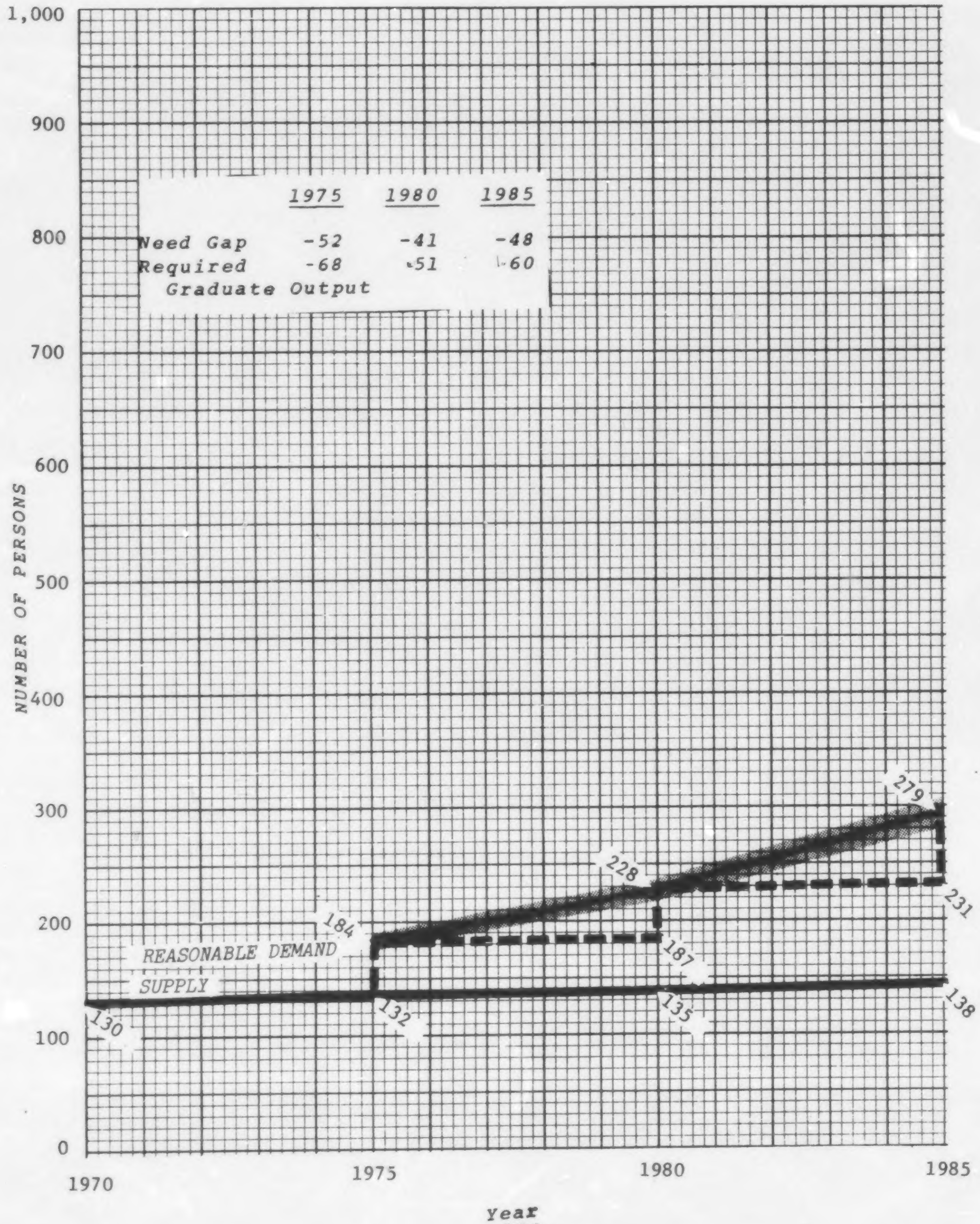
AREA 3



	1975	1980	1985
Need Gap	-105	-79	-102
Required Graduate Output	131	99	128

GRAPH #11

HMOC: Dental Laboratory Technicians
AREA 4



	1975	1980	1985
Need Gap	-52	-41	-48
Required Graduate Output	-68	-51	-60

At this time, however, since no firm conclusions have been reached we demur from addressing this possibility even speculatively.

In any case, shortages in the HMOC will continue to exist and those educational institutions of the state which are capable of clustering their curricula in the dental auxiliary fields should consider launching dental laboratory technician programs. It is therefore recommended that:

Recommendation #20 - The creation of additional dental laboratory technician training programs should be fostered within the State. Priority in approving such programs should be given to those institutions which already have, or can present well elaborated plans to establish other dental auxiliary programs, so that the benefits of program clustering can be realized.

PHARMACISTS

The HMDP analyses in the field of pharmacy indicate a very large disparity will exist between the future supply and demand for such personnel. (1) This is the case whichever projection model is used, although in the case of the first the supply and demand lines are actually converging very slowly. The first model, based on a projection of the number of prescriptions filled, was initially rejected for all of the reasons cited in the HMDP study by several experts in the field who present compelling arguments refuting the validity of that approach. (2) The second projection model, whose demand line is closely allied to the percentage increase in the projected number of physicians'visits, is also presented. The result is a divergency between projected supply and demand more marked than in the case of any other HMOC studied. Neither method of projection is necessarily the optimum. The resulting dilemma, however, is not one which need preclude further discussion and recommendation here, since in both cases the supply line is identical.

The results of the HMDP study are shown in both Graphs 1 and 2 on the following pages, however, to illustrate the fundamentally different situations resulting from the methodological approaches represented in projection models I and II. Both models are projected only on a statewide basis in recognition of the fact that the Rutgers College of Pharmacy is the single institution training such personnel in New Jersey at the present time.

The supply line for the year 1975 in each graph is adjusted upwards to reflect an anticipated rise in graduates between 1970 and 1975 from 35 to 108, as a consequence of the completion in 1971 of the College of Pharmacy's new facilities on the Rutgers University Heights campus in Piscataway. The increment of new graduates shown on the supply line as available for work in New Jersey, is adjusted by a 75 percent "in-state

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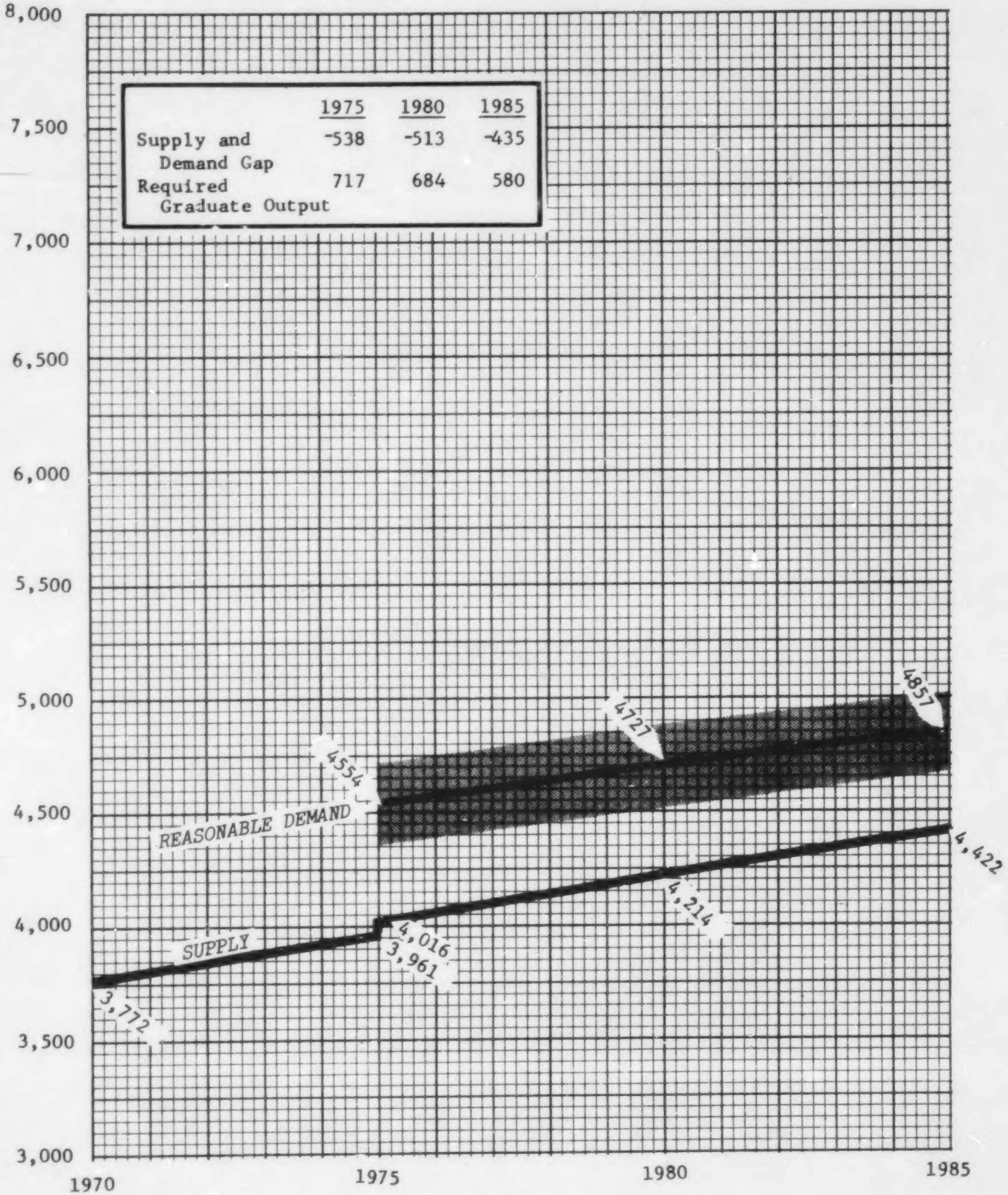
(1) Appendix E, pp. 195-213; see also Section 4 (Health Manpower Data Summary) Tables 10 and 12, on pp. 72 and 85 respectively.

(2) A conference held by the Department on March 15, 1972 with representatives of the N. J. Society of Hospital Pharmacists, the N. J. Pharmaceutical Association, and the Rutgers College of Pharmacy, provided further confirmation of the correctness of this choice from the point of view of methodology.

MANPOWER GAP: Graph #1

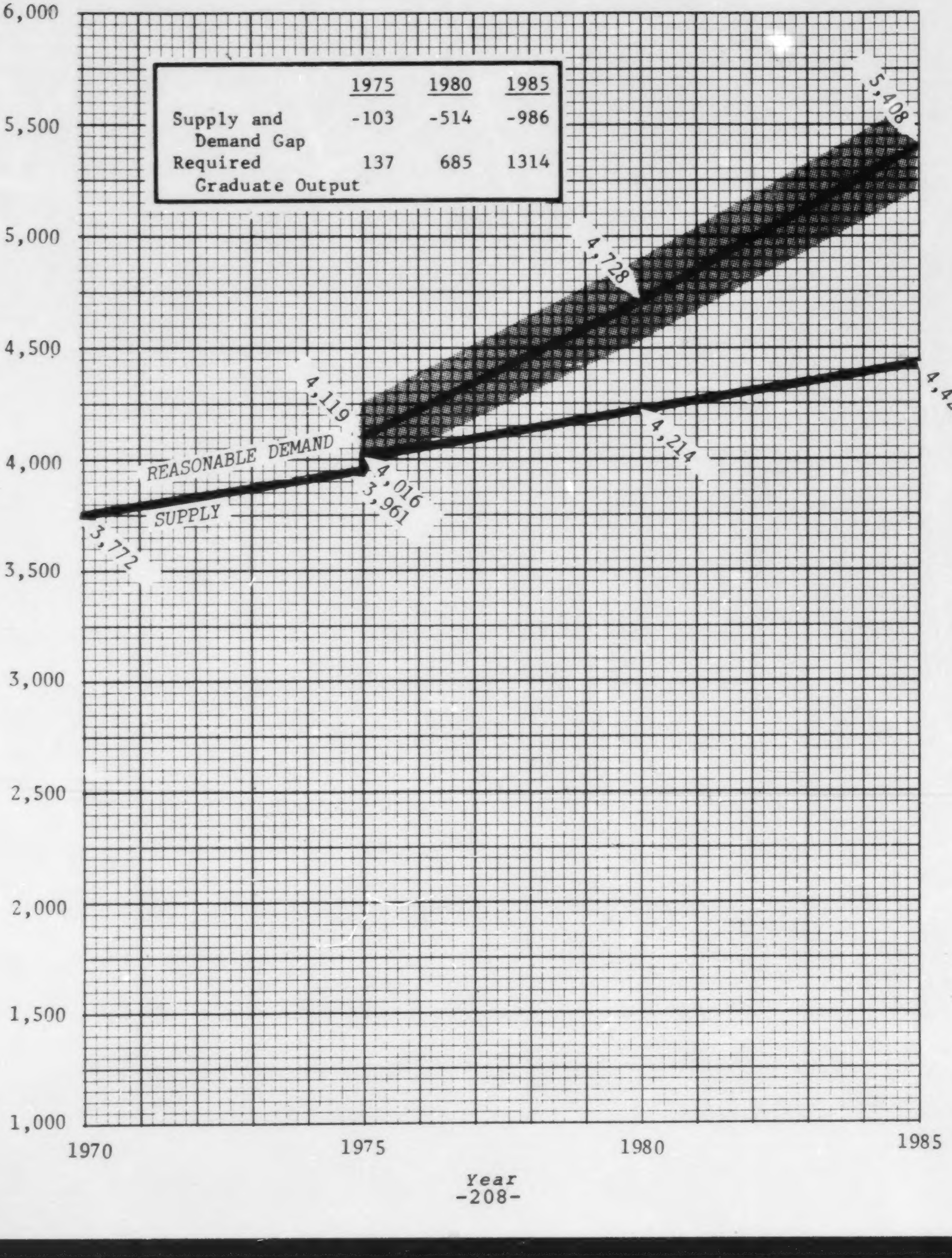
HMOC: Pharmacists

Statewide Basis-PROJECTION MODEL I
Reflecting Number of Prescriptions Filled



	1975	1980	1985
Supply and Demand Gap	-538	-513	-435
Required Graduate Output	717	684	580

MANPOWER GAP: Graph #2
HMOC: Pharmacists
Statewide Basis-PROJECTION MODEL II
Reflecting Number of Physicians' Visits



	1975	1980	1985
Supply and Demand Gap	-103	-514	-986
Required Graduate Output	137	685	1314

survival" factor.[3] Similarly, on the tables inset into the Graphs the supply and demand gaps are adjusted by the same 75 percent factor to show the consequent required graduate output total.

The growing divergence between supply and demand shown on Graph 2 acquires further force when the College of Pharmacy's present forecasts of enrollment and graduate totals are taken into account. Attempting a tenfold increase in those totals by 1975, alone, poses serious problems related to acquiring the necessary human, capital and fiscal resources to accomplish the task. For this and other reasons it is not at all clear that this approach to closing the pharmacist manpower gap is the necessary or even indicated strategy. Therefore, no proposed strategy line to close the gap has been added to the graphs.

Recently, some additional factors concerning the productivity of pharmacists and the supply of pharmacists has come to our attention; however, for a number of reasons the data were not incorporated into our projections at this time.

A recent publication of the National Association of Registered Druggists (NARD) suggests that pharmacists presently fill an average of 4.6 prescriptions per hour. If the number of prescriptions were to double, the NARD contends that productivity could readily be increased by 50 percent, and it is estimated that the pharmacist could fill 6.9 prescriptions per hour.

We are reluctant to factor this information in our projections for two reasons. The first is that the productivity data are measured in man hours, while our projections are based upon the number of pharmacists. The increase in productivity per man hour and the increase in productivity per man will be the same only if the number of hours worked remained the same. If, as seems reasonable, the hours of work will decline, then productivity per man hour will be greater than productivity per man and, therefore, demand projections based upon the productivity estimates developed by NARD will be too low.

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(3) A 75 percent "in-state survival" factor was selected as best representative of this HMOC's migration characteristics, as a consequence of a lengthy discussion at the conference on March 15, 1972 with representatives of the pharmaceutical community in the State. It is actually quite high as contrasted with other HMOCs with comparably lengthy educational processes; but we are advised that it would appear reasonable due to the small entrepreneurial nature of much pharmacist employment, and their tendency to establish such businesses close to their place of residence and origin.

The second reason for not incorporating these factors in the present projections is that both projection models already assume a growth in productivity of 3 percent per year.(4) This growth factor is based upon historical data and appears to represent a reasonable assumption because of the continuing introduction of new technology (i.e., new counting machines and computers for billing and information storage).

Another factor we have been asked to consider is that in 1970, New Jersey entered into reciprocal licensure agreements with a number of other states. Clearly, these agreements are likely to affect the supply of pharmacists in the State. At this time, however, it is difficult to estimate the net effect of these agreements for the following reasons:

1. The large backlog of out-of-state registered pharmacists who desire to register in New Jersey is probably a misleading indicator of what will happen in the future. The initial years' spurt in registrations following these agreements will likely represent a one-time phenomenon.

2. Information is not available on the number of new registrants who actually choose to work in the State.

3. The reciprocal agreements obviously work both ways. Thus, the acceptance of a New Jersey license by other states might induce pharmacists currently working in the State to seek work outside of the State. Supply projections that ignore the outflow of pharmacists will overstate actual supply increases.

It has further been pointed out to the Department that pharmacists are willing and anxious to participate more fully with other professions on the health care team. Community, or retail, pharmacists have several suggestions for expanded roles, including serving as more effective health educators, participating with physicians in controlling drug reactions and interactions, and in maintaining patient or family drug profiles. Similarly, hospital pharmacists are seeking participation in the activities at nursing stations and at the patient's bedside, and eventually hope to participate with physicians on rounds so that their knowledge of drugs and pharmacology as applied to disease states can be utilized.

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(4) The HMDP data underlying Projection Model II has been modified to also reflect a 3 percent increase in productivity by the Department before constructing Graph #2. The HMDP had applied this productivity factor to its data solely with respect to Projection Model I.

There is also the hope that pharmacists can have greater involvement with laboratory, radiology, dietary, physical therapy and other hospital departments concerned with the intended and unanticipated reactions to drugs.

Such expanded roles for pharmacists would, however, only serve to emphasize and accentuate the demand for pharmacists. Yet it is precisely our present projected demand for pharmacists which some spokesmen are fearful may be excessive. Therefore, until such time as trends in the responsibilities of pharmacists clarify in practice, we would suggest that the alternative approaches incorporated in our recommendations which follow, would be more reasonable at this time.

This plan consequently proposes that a combination of the below listed "holding" actions should be pursued. A periodic reexamination of the data will be conducted to assess the impact of such recommended activities upon manpower needs in this HMOC, and possibly set the stage for a reevaluation of future requirements in the field:

1. Attempt to achieve more efficient utilization of those pharmacists who will be available.

2. Explore the feasibility of a new type of health professional, a pharmaceutical aide or assistant, who can assume, with a lesser degree of educational preparation, some of functions presently performed by pharmacists.

3. Examine current and projected plans for the use of the facilities of the Rutgers College of Pharmacy with a view to carefully increasing its enrollment capacity.

A. Increasing Efficiency of Pharmaceutical Services

As in the case of other HMOC's, it must be decided whether to invest resources in preparing personnel to fully staff a delivery system whose current organizational patterns might be questioned. The deployment of pharmacists in a highly decentralized network of small business establishments much of whose activity is unrelated to health care per se, has been brought to our attention as a possible case in point. Unfortunately, we have been unable to locate any serious body of literature and sustained inquiry on this question. For this reason we recommend:

Recommendation #1 - The Rutgers College of Pharmacy should immediately establish a task force to recommend applied research regarding alternative ways of delivering pharmaceutical services of high quality. This task force should be representative and fully reflective of the realities of the practice of pharmacy. Consideration should be given to mechanisms which have been developed abroad, and attention given to such questions as centralization of services and the provision of 24-hour service to the community.

Recommendation #2 - The Rutgers College of Pharmacy should be encouraged to further introduce into its curriculum material which will sensitize its students to the import of the changing need for pharmaceutical services. It should develop understanding of alternative educational opportunities in pharmaceutical science and of different modes for the delivery of pharmaceutical services.

B. Development of a Pharmaceutical Assistant

In recent years the pharmacy profession has recognized its responsibility to examine this issue, particularly with respect to future manpower plans. The August 1969 issue of the Journal of the American Pharmaceutical Association contained a "Report of the Task Force on Practitioner's and Subprofessional's Roles in Pharmacy". The Task Force stated that its report was developed through a deliberative and democratic process, although the group involved noted they were acting as individual pharmacists and were not implying that their recommendations had been endorsed by the various organizations of which they were members. They hoped, nevertheless, that the report would provide a common basis for evaluating the role-functions constituting the practice of pharmacy.

The report noted that while pharmacists may delegate certain functions and physician operations, they cannot be divested of overall responsibility. In this admonition the report went on further to emphasize that the pharmacist is capable of "supervising" himself and bears that responsibility at all times; it further assumed that in any system integrating auxiliary personnel, that they must and will be supervised by a professional person. The report contained a detailed listing of role components for supportive personnel.

In the current practice of pharmacy in communities, institutions, industrial laboratories and in hospitals, in fact, many traditional functions of the pharmacist are being assumed by assistants under the direct supervision of a pharmacist. These assistants are now being trained on the job without formal preparation or recognition. As is occurring in a variety of health care fields, the time would appear ripe to seriously examine whether the structured utilization of auxiliary personnel in pharmacy cannot also be applied, with appropriate educational programs developed to prepare such personnel. It is therefore recommended that:

Recommendation #3 - The Health Professions Education Advisory Council should create a study group to determine if a need exists for an associate degree program at the community college level, which would prepare a pharmacy aide or assistant who could contribute to the more efficient use of the pharmacist's time. Representatives from the Rutgers College of Pharmacy, the two year colleges, and the various professional organizations and facets of the pharmacy profession, should be included in this study group.

C. Increasing Enrollments at the Rutgers College of Pharmacy

The College of Pharmacy's move into its new building in July 1971 brought to a close an 80-year tradition of educating pharmacists in Newark, and opened an era of expanded capacity for instruction and research in the profession. Containing 90,000 square feet of floor space, the building is divided into a five story undergraduate instruction wing, and a smaller section devoted to graduate study and faculty research. The building incorporates facilities for animal housing and experimentation, radioisotopes, electronic instrumentation, pilot plant manufacturing, high pressure experiments, closed-circuit instruction units and other audiovisual aids,data processing equipment, and a varied assortment of laboratories, lecture halls, student activity areas and offices. In short, it represents a modern, well-equipped and flexible facility which would appear capable of serving as the base for an expansion in the number of pharmacists produced in New Jersey.

Because we lack at this time analyses which would indicate whether and to what extent the instructional capacity of the College of Pharmacy could be increased, it is recommended that:

Recommendation #4 - The Department of Higher Education and the Rutgers College of Pharmacy jointly conduct studies of space utilization factors, and methods for extending the length of the school year and day, to determine the extent to which enrollments can be increased at the College. Simultaneously, analysis should be made of the effect upon current admissions and academic standards of any substantial enrollment increase, with a view to identifying a proper level for such standards, in order to produce graduates of the requisite quality to meet the public's health care needs. Study should also be made of the consequences of reduction of internship on (1) the number of pharmacists graduated and (2) the quality of training received.

We believe that a further virtue resides in taking the above approaches, as an alternative to developing plans to dramatically increase the number of pharmacists trained, in that we could thereby avoid contributing to a possible overproduction in the field. As previously noted we are in accord with the arguments raised against the prescription based demand model, with its implications for a much lower need for pharmacists; but it must be conceded that many practicing pharmacist do not anticipate manpower shortages of the magnitude forecast in Graph 2. The previous recommendations call for avenues of investigation which should usefully clarify the issues involved in meeting higher education's responsibilities in this field, and provide a sounder basis for master planning in the future.

Finally, we wish to strongly endorse the principles of mandatory continuing education for pharmacists contained in Senate Bill No. 640 which supplements Chapter 14 of Title 45 of the statutes describing professions and occupations. The bill, recently approved by the State Legislature, requires participation in continuing education activities by pharmacists as a prerequisite for licensure renewal. A Council on Continuing Pharmaceutical Education has been formed consisting of a representative of the Chancellor of Higher Education, the Dean of the Rutgers College of Pharmacy, the President of the State Pharmacy Board and two officials of the N.J. Pharmaceutical Association. The Council is currently establishing criteria by which to accredit formal programs and home study courses, and is establishing procedures for determining and certifying compliance to the Board of Pharmacy. To assist in the realization of qualitative programs in this area, it is therefore recommended that:

Recommendation #5 - The Rutgers College of Pharmacy should make available its full cooperation, resources and services to the Council on Continuing Pharmaceutical Education, to assist in the establishment and maintenance of a program of the highest quality.

VETERINARIANS(1)

What is Veterinary Medical Service?

This report on veterinary medical service assesses those activities of veterinarians included in veterinary science and veterinary medicine. Veterinary science is that body of knowledge derived from basic and applied studies of biological processes and diseases in all animals except man, whereas veterinary medicine relates to the delivery of a diversity of vital health services to society. Veterinary Medical service involves both aspects and thus is included as a part of the Master Plan for Veterinary Medical Education.

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(1) The narrative and the projections for this HMOC are drawn from a report submitted to the New Jersey Veterinary Medical Education Advisory Council on June 7, 1972 by David C. Tudor, V.M.D. of Rutgers University on "Veterinary Medical Service in New Jersey and the Need for Veterinary Medical Education."

In order to keep this section of the Master Plan consistent with the previous sections, Dr. Tudor's methodology was modified in three ways:

The first modification was to develop separate projections of manpower supply and manpower demand for 1975 and 1985 since the Tudor study made a single projection for 1980. The demand projections for 1975 and 1985 were based upon population growth and the supply projections were developed from historical net increases of 20 veterinarians per year.

The second way in which the methodology was modified was to change the base year of the study from 1971 to 1970, the base year that was assumed for the other HMOCs.

The third change was to include additions to the supply of veterinarians resulting from the passage of the Veterinary Medical Education Act of 1971.

The Veterinary Medical Education Act authorized the Board of Higher Education to enter into contractual agreements with out-of-state universities to encourage their admission of New Jersey students. Currently, contracts have been signed with Ohio State and Washington State, for six spaces and funding has been provided for 13 additional spaces. Applying an instate survival factor of .5, we would expect that ten new veterinarians would be available in the State once the entire program is in operation. The results of these three modifications are presented in graph #1.

Present Status of Veterinary Medical Education in New Jersey

1. New Jersey ranks 46th among the 50 states in the numbers of students gaining entrance into a veterinary school.(2)

2. Only .27 students per year per 100,000 population are admitted from New Jersey.(3)

3. In 1971-72, only 11 New Jersey residents were admitted into schools of Veterinary Medicine for the Class of '75 (freshman class).(4)

4. New Jersey is only one of five states with a population of 5 million or more that does not have a veterinary school.(5)

5. The United States average is 13.1 veterinarians per 100,000 population;(6) New Jersey has only 9.8 per 100,000 population. Present adjusted census figures for 1970 indicated 7,171,043 people in New Jersey; a projected increase of 923,977 people to 8,095,020 in 1980 is expected.(7) This means that New Jersey must have 121 veterinarians by 1980 just to cope with the population increase.

6. In 1961, the United States Senate Committee on Government Operations estimated that by 1980, the health needs of the country would require 17.5 veterinarians per 100,000 population or about 40,000 veterinarians, but only 33,000 will be available on the present production basis,(8) since only 1,240 veterinarians graduate each year.(9) There are about 25,902 veterinarians in the United States today.(10)

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(2) New Horizons for Veterinary Medicine. National Academy of Science, Washington, D. C.. 1972

(3) Ibid.

(4) "Student Enrollments in Veterinary Colleges, 1971-1972". Journal of A.V.M.A., Vol. 160, Feb. 15, 1972, page 399.

(5) New Horizons for Veterinary Medicine. op. cit.

(6) Ibid.

(7) Population Data. Mr. Watson, Department of Census, Trenton, N.J.

(8) Veterinarians for the South. Southern Regional Education Board, 130 Sixth St., N.W. Atlanta, Ga.

(9) New Horizons for Veterinary Medicine, op. cit.

(10) Ibid.

7. Veterinary medical education is very costly. It has been pointed out that nationally, $8,200 of non-federal funds is being spent per year for the education of each professional veterinary student.(11) New Jersey is presently expecting to spend only $5000 per student for 19 students. The education of 19 students would simply maintain the status quo of entrants which existed for the 12 years prior to the Veterinary Medical Education Act of 1971. Without the Act, given the increasing numbers of applicants to the veterinary schools of the nation, and increasing pressures upon these institutions to limit enrollment to in-state students, it would appear that the numbers of New Jersey students admitted would fall significantly.

8. Approximately 75 to 90 New Jersey students apply to veterinary schools each year, of whom only about 17 to 20 are accepted. About half of the New Jersey students who graduate from professional schools return to practice within the State. This is presumed, since about half of our present practitioners were originally New Jersey residents. Whereas approximately 17 to 20 New Jersey students, at most, graduate each year, New Jersey must rely on out-of-state non-resident graduates to maintain veterinary services. The chances of maintaining satisfactory veterinary service in New Jersey in the future are not good at the present rate of education since vacancies presently exist.

9. Loss to the veterinary profession in New Jersey due to retirements or mortality is about 3% per year (12) or about 21 veterinarians.

10. The loss created by transient veterinary personnel leaving the State is estimated to be between 20 or 30 per year. This is partly offset by newly licensed veterinarians which number about 38 per year.

11. There is presently a demand for at least 120 veterinarians within the State to fill vacant positions. This was determined by a survey conducted by the New Jersey Veterinary Medical Association in 1969.

12. The University of Pennsylvania and Cornell University have been extremely generous neighbors and have contributed greatly to the veterinary service of New Jersey. The University of Pennsylvania graduated 167, and Cornell, 86 of the 426 licensed practitioners in New Jersey in 1969. In the period 1959-1969, the University of Pennsylvania had accepted 34, and Cornell 9, from a total of 46 pre-vet Rutgers students. The University of Pennsylvania had accepted 90, and Cornell 26 New Jersey students or a sum of 116 from a known total of 174 New Jersey students who had been accepted at veterinary institutions in the ten-year period, 1959-1969.

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(11) Veterinarians for the South. op. cit.

(12) New Horizons for Veterinary Medicine. op. cit.

13. Despite the increased population of New Jersey and increased enrollments at veterinary institutions, the number of New Jersey students enrolled at veterinary schools has remained relatively constant, but there is an increasing reluctance by professional schools to admit New Jersey trained pre-veterinary students.

Present and Future Needs for Veterinary Medical Personnel

1. The practice of veterinary medicine and the provision of veterinary medical services applies to veterinarians who are engaged in private clinical services and in public activities in government and in industry. *Large animal* practitioners offer private clinical service and are classified into two groups: those engaged in *food animal practice* and those in *equine practice*. *Food animal practice* preserves our meat and milk buffer by safeguarding our supply of food. Animal inspection, vaccination and treatment provided by veterinarians maintain the health of our livestock and thus insures a continuing food supply. Although there is a documented decrease in food producing animals within New Jersey, the demand for the equine practitioner will increase. New Jersey presently has 1,200 dairy,(13) 200 beef cattle, 170 goat, 658 sheep and 129 swine farms serviced by about 47 large animal veterinarians.(14) By 1980, these figures should approximate 700 dairy, 210 beef cattle, 170 goat, 700 sheep and 100 swine farms which should require the services of about 35 veterinarians. The replacement of small farm units by larger farms will continue to influence the degree and types of specialization of practice in food animal medicine. As the number of farms decrease, however, the animal and bird populations per farm increase so that the total effect on veterinary service is not a straight line reduction in needs. Veterinary service largely follows the total animal population which is being decreased at a rate less rapidly than the reduction in farm units.

2. New Jersey presently has within the State 4 race tracks and 35,000 racing and saddle horses involving 5,000 stables and 10,000 horse owners. These are serviced by about 90 *equine practitioners*.(15) With still another race track to be added in the meadowlands and the anticipated numbers of racing and saddle horses to increase to 50,000-65,000 with 7-10,000 stabling facilities and 15-20,000 horse owners involved, the number of practitioners required in this type of practice is expected to reach 160 by 1980. The value of the equine industry alone represents between 500 million and 1 billion dollars in New Jersey. Veterinarian services to the State's equine interests not only provide medical and surgical care, but include assistance in the thoroughbred breeding

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(13) *New Jersey Dairy Industry in the 1980's*. Rural Advisory Council, N. J. Department of Agriculture, 1969.

(14) *Practicing Veterinarians*. Dr. E. Brower, N. J. Department of Agriculture.

(15) *Ibid*.

program and the new standard bred sire stake program. It is considered that the 250 standard bred horses present in 1971 will reach 950 by 1973. In addition, another breeder award program involves non-racing horses. Each of these programs will increase the need for veterinary services.

3. Small animal medical and surgical care for household pets is a growing role for clinical veterinary practitioners. Not only do they relieve the pain and suffering of animals, but they service a vital emotional need for a large segment of our growing urban population. Veterinarians engaged in such practice also provide continued surveillance of the many diseases transmitted from animals to man. Transmissible disease outbreaks can be largely controlled before they become serious through the routine surveillance provided by the small animal clinician, whose activities also include service on municipal and county boards of health, community hospital boards, rabies control clinics and pet shows, among other things. The numbers of small companion animals are increasing annually. A survey in 1968 indicated that 45.2% of all U.S. households owned either a dog or a cat. This means that with a projected increase in human population from 7,171,043 in 1970 to 8,095,020 in 1980(16), or an increase of 923,977 people, we can anticipate a pet increase of 138,597 animals. With a ratio of one veterinarian for 600 pets(17), this would indicate about 230 additional small animal clinicians will be needed by 1980 in New Jersey.

4. The Industrial Veterinarian is largely employed in clinical research, laboratory animal medicine, and in the basic sciences, which include taxicology, histopathology, pathology, physiology and parasitology. Supervision and cooperation in research in the 20 New Jersey based pharmaceutical firms is an expanding role for the veterinarian. The rapid evolution of health research and federal legislation involving laboratory animals has made it illegal for animal care programs in large institutions to be administered by anyone but a veterinarian. Many have found it necessary to provide centralized animal research facilities under professional supervision. This trend will continue, thus providing a demand for at least 128 veterinarians by 1980.(18)

5. Other Needs:

The Wildlife Division of the State does not have a veterinarian specifically employed in the wild life area, but by 1980 it is conceivable that the full-time service of a veterinary pathologist will be needed. At present, veterinary personnel in various state agencies provide assistance to the Fish and Game Commission. The expansion of zoo activities in the State would likewise require veterinary supervision.

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(16) Population Data. op. cit.

(17) Veterinary Medical Manpower Trends in Indiana, With Some National Comparisons. Manpower Report, 1971-72, July 15, 1971. School of Technology, Purdue University, Lafayette, Indiana.

(18) Industrial Veterinarians. Dr. G. Lord, Johnson & Johnson Research Foundation, New Brunswick, N. J.

The public health veterinarian focuses his attention on the interrelationships of animal and human health. Local and state health departments will have an increasing responsibility in our densely populated state. Nationwide, the U. S. Department of Health, Education and Welfare has increased its employment of veterinarians in public health affairs at the rate of 10 percent per year. Similar developments in New Jersey might also be anticipated.

Military medicine will continue to occupy the duties of several veterinarians in the prevention of disease and the preservation of the health of the armed forces. Future needs may require ten veterinarians on a peace time basis.

Regulatory activities are related to the control of communicable animal and bird disease problems within the State and between the states, as well as those associated with importation from foreign countries. These regulatory responsibilities are supervised in New Jersey by State and federal veterinarians and their staffs. Since the food animal population within the State is slowly decreasing, the State and federal regulatory staff will have a decreasing responsibility for food producing animals, but an increasing one for equine animals. Another area in New Jersey for which increased veterinary services may be required is in association with marine life and related pollution problems.

Meat inspection has become the responsibility of the state employed veterinarians, but since meat inspection is expected to decline as the 25 regular and 11 custom slaughter houses reduce their operations, fewer veterinary meat inspectors will be needed.

Teaching functions and institutional research in this State presently occupy the services of 17 veterinarians. Present positions in this area should remain reasonably constant although any increase in educational programs for auxiliary veterinary medical personnel as at Camden Community College, would mean more veterinarians involved in this type of teaching.

Table I represents the areas of veterinary medical service covered in this report. We presently have a total of 632 licensed(19) and 75 unlicensed veterinarians. If we are to equal the 61% needed increase projected by the National Academy of Sciences, we should have 1340 veterinarians by 1980. If we take the United States average of 13.1 per 100,000 population figure as a guide, New Jersey should have 940 veterinarians now and 1,061 by 1980. Obviously, the 707 presently active veterinarians are inadequate to meet the needs of the State. The New Jersey veterinarians

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(19) Licensed Veterinarians. Dr. I. Botwinick, N. J. Veterinary Examining Board.

TABLE I

VETERINARY MEDICAL SERVICES

Major Activity	Number of Veterinarians			
	U.S.		N.J.	
	1970	1980	1971	1980
Food Animal Practice	6242	6250	47	35
Small Animal Practice	10931	21900	414	644
Equine Practice	804	1600	90	160
Laboratory Animal Medicine	342	700	-	-
Zoo Animal Practice	40	80	-	2
Wildlife Animal Practice	14	50	0	1
Public Health	276	570	13	14
Military Veterinary Medicine	770	450	7	10
Regulatory Veterinary Medicine	1227	1900	13	15
Meat Inspection	1885	1900	21	18
Industrial Veterinary Practice	506	1400	93	128
Teaching and Research	1611	3200	9	13
Other Veterinary Practice	477	770	-	-
Retired [1]	777	1200	21	31
Marine Veterinary Practice			0	1
	25902	42000[2]	707	1040

	1971	1980
Human Population in N. J.	7,171,043	8,095,020
Expected Increase in Population (1971 - 1980)		923,977
Current Supply of Veterinarians	707	
61% Increase as projected by National Academy Science report	827[3]	1,340
13.1/100,000 x 71.7 = Number required now on population basis	940	1513[4]
13.1/100,000 x 80.9 = Number required by 1980 on population basis		1061
13.1/100,000 x 9.23 = Number resulting from population increase only		121
Anticipated number needed by 1980		1040

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1. Retired, not included in total,3%
2. Based upon a 61% projected increase in need.
3. 707 + 120 = Number we should have now.
4. Based upon a 61% projected increase in need.

surveyed in 1969 indicated a need for an additional 120 professionals with additional openings anticipated in the future. The existing 707 supplemented by the presently needed 120, would total 827 veterinarians or 113 short of the figure for the national average.

The education of 20 veterinarians per year would provide us with 160 in 8 years or 866 by 1980. Since not all may return to New Jersey, additional professional service should be obtained from out-of-state residents.

We now have 707 and if we wish to meet the calculated U.S. average of 13.1 per 100,000 or 940, we would be 233 short, and by 1980, we would need an additional 121 or a total of 354 more. We would receive under our present program, 160, thus we need to secure a total of 194 more, or at least 25 more per year.

The results of Dr. Tudor's analysis and our modifications are presented in graph #1. It should be noted from the inset table in graph #1, that a need gap is projected in each of the projection periods. Furthermore, projections of supply and demand tend to converge; however, if we accept Dr. Tudor's methodology, the need gap will not disappear within the projection period.(20)

Further Analysis and Recommendations

Upon a careful reading of Dr. Tudor's report, one finds many compelling reasons for accepting his methodology and his projections. For example, Dr. Tudor expects strong increases in demand for veterinarians engaged in small animal practice, equine practice and clinical research. For the purposes of comparison, however, an additional set of projections are presented in graph #2. This graph follows more closely the methodology of HMDP.(21)

The essential difference between the two sets of projections rests upon the assumption in the Tudor study that New Jersey should attempt to attain parity with the nation in its ratio of veterinarians to the population. In order to accomplish this, the ratio must be increased from 9.8 veterinarians per 100,000 of the population to 13.1 veterinarians per 100,000 of the population. The HMDP projections, however, are based upon population growth and an adjustment for current unmet needs.

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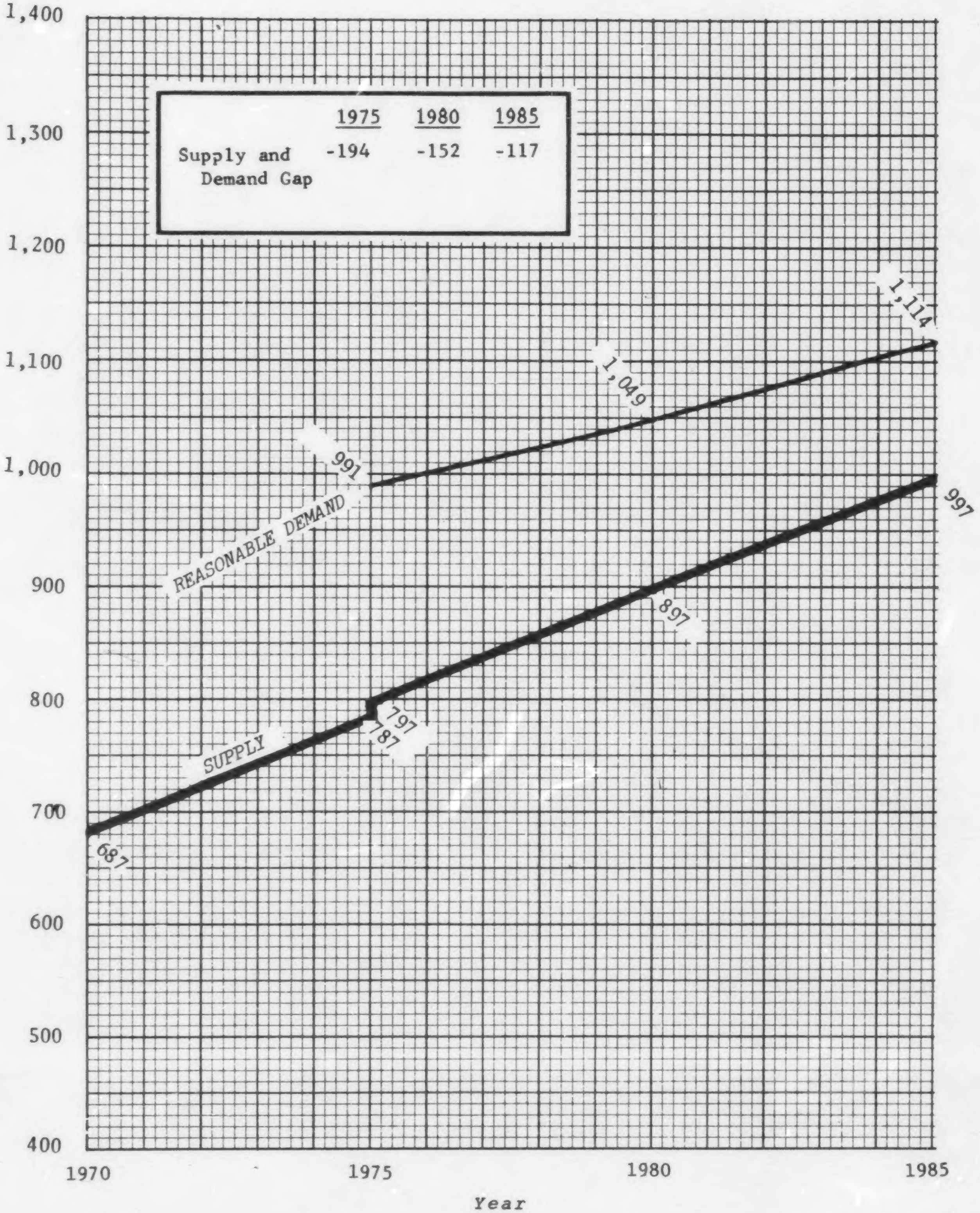
(20) The inset table does not include a graduate output since New Jersey does not have a school of veterinary medicine. Furthermore, the calculated need gap in 1980 is different from Dr. Tudor's projected gap because of a shift in the base year.

(21) Appendix G, tables 1 and 2, pp. G-2-3, and pp. G-4-6.

MANPOWER GAP: Graph #1

HMOC: Veterinarians

Statewide Basis-PROJECTION MODEL I

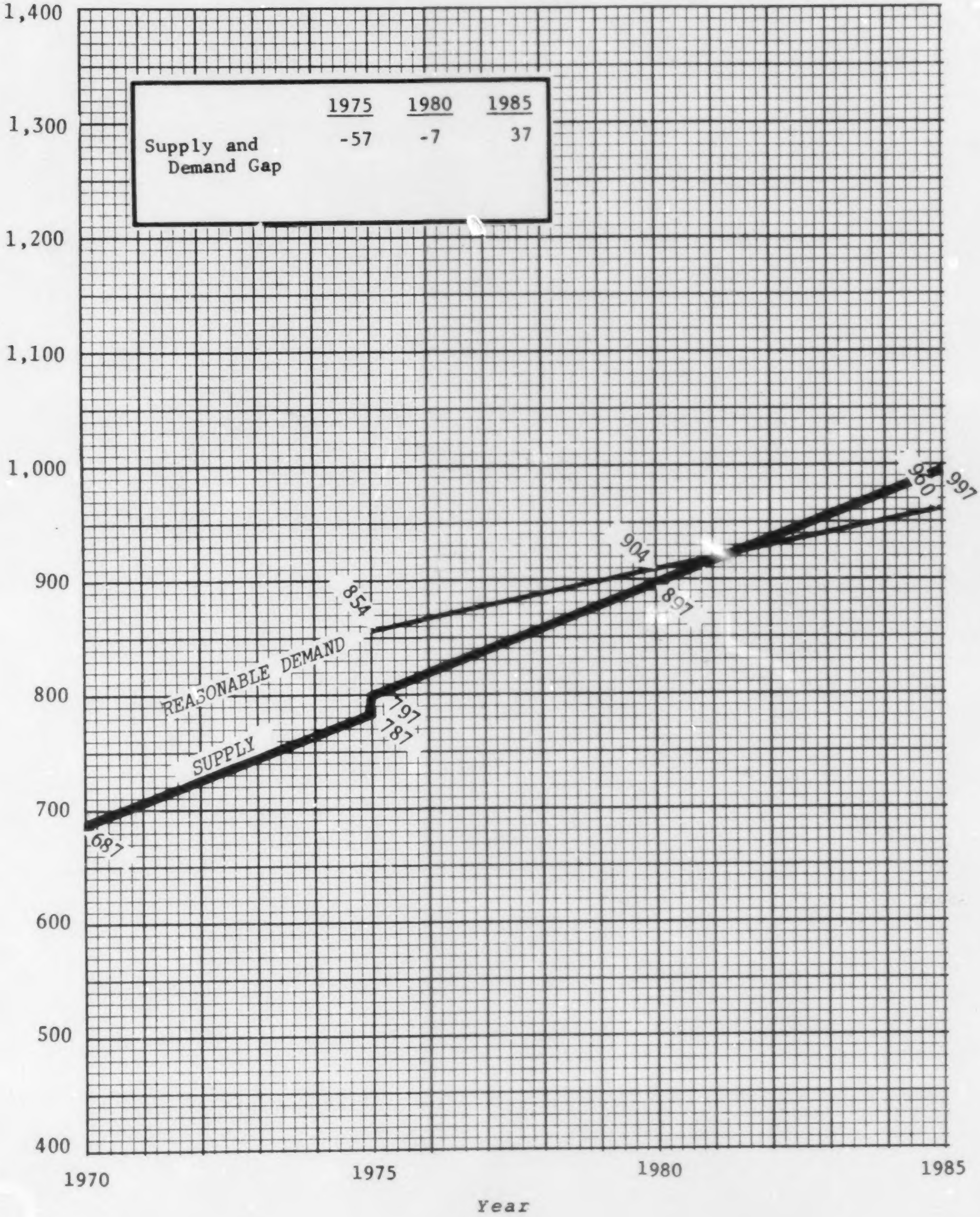


	1975	1980	1985
Supply and Demand Gap	-194	-152	-117

MANPOWER GAP: Graph #2

HMOC: Veterinarians

Statewide Basis-PROJECTION MODEL II



	1975	1980	1985
Supply and Demand Gap	-57	-7	37

The methodology assumes that New Jersey will continue to maintain its current ratio of veterinarians to the population. The assumption is justified since we do not know whether the national ratio is the appropriate one to apply to the State.

It is clear that the HMDP projections presented in graph #2 and its inset table indicate a more rapid convergence of supply and demand - that is, assuming no significant change in the factors affecting supply and demand, the need gap would be eliminated between 1980 and 1985.

The implication that can be drawn from the two sets of projections is that our recommendations for this HMOC should not be tied to either parameter of need; rather the recommendations should provide for short run and long run solutions to the manpower problem.

In order to meet the expected manpower shortage we recommend that:

Recommendation #1 - The number of veterinarians educated under official State auspices should be raised to at least 35 per year. The Department with the assistance of the Veterinary Medical Education Advisory Council should seek to meet that goal through some combination of increased numbers of student spaces contracted for under the Veterinary Medical Education Act of 1971, and/or consortium arrangements concluded with existent or newly formed veterinary medical schools in other states.

Successful efforts by the Veterinary Medical Advisory Council, and other interested groups, in encouraging more out-of-state residents to practice in New Jersey are likewise desirable. Another method by which the need gap can be closed at a more rapid rate than projected is through increases in veterinarian productivity. Since little is known about veterinarian efficiency, it is recommended that:

Recommendation #2 - The Veterinary Medical Education Advisory Council, in conjunction with other interested parties, consider establishing a task force to explore methods by which productivity can be increased. The task force should concern itself with the ways in which current technology can be effectively integrated into all aspects of veterinary practice.

It has been suggested that veterinary medicine, unlike human medicine, has just barely begun exploring the possibility of increasing veterinarians' services by extensive use of associated trained personnel. While it may be difficult at this point in time to estimate the increased efficiencies associated with the use of paraprofessionals in veterinary practice, it is reasonable to believe that the impact on services should be at least as great as the impact on physician and dental services. (22)

New Jersey might therefore encourage the further utilization and development of animal technician education programs. The technician working under the direct supervision of the veterinarian could presumably perform such functions as: record vital information; perform necessary tests; prepare and administer injections and apply medication; provide information to clients concerning the handling and restraint of pets; and provide first aid.

If the animal technician is allowed to be involved in these procedures, it seems clear that veterinarian efficiency could be improved and therefore we recommend that:

Recommendation #3 - The Veterinary Medical Education Advisory Council immediately study the need, and if justified, make recommendations regarding the creation of additional programs at the A.A.S. level, designed to train animal technicians. These programs should follow the guidelines established by the American Veterinary Medical Association's Council on Education.

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(22) Veterinary Medicine Education in Wisconsin. Wisconsin State University, River Falls, Wisconsin.

MEDICAL TECHNOLOGISTS

The occupational definition for this HMOC refers to a general classification of personnel who have completed a four year college program, including a clinical component approved by the Council of Medical Education of the A.M.A. Upon further specialization the technologist can enter the fields of blood banking, chemistry, microbiology, hemotology, nuclear medicine technology, cytotechnology and histologic techniques.(1)

The supply and demand projections are presented on a statewide basis because data for a regional analysis are not available.

Two projection models are presented for the purpose of comparison. Projection model #1, presented on the following page, is based upon the HMDP projections of a 4% per year growth in supply (Appendix G, tables 1 and 2, pp. G-2 to 3). Projection model #2, presented in graph #2, assumes an 8% per year increase in supply which is equal to the national growth rate.

The supply line is further increased to reflect the expected net increase in supply from medical technology programs established recently at Caldwell College and Monmouth College.(2)

It should be remembered that the 4% growth rate in supply as well as the 8% growth rate are assumed because historical data from which past trends in supply could be determined are not available. It is possible, however, to check the validity of our supply projections by comparing the assumed projected increase in supply with the increase that is expected from current programs.

An assumed growth rate of 4% per year in supply implies that the labor force of medical technologists will grow by an average of 49 manpower units each year for the next fifteen years. If we apply an instate survival factor of 65%, the required graduate output would be 75 per year; however, because of possible instate migration of medical technologists the required graduate output could be smaller than 75 per year. If the 8% growth factor is used, the projected net increase in supply would be 125 manpower units per year. For the State to match this growth rate in supply, the graduate output of medical technologists would have to amount to 192 per year.

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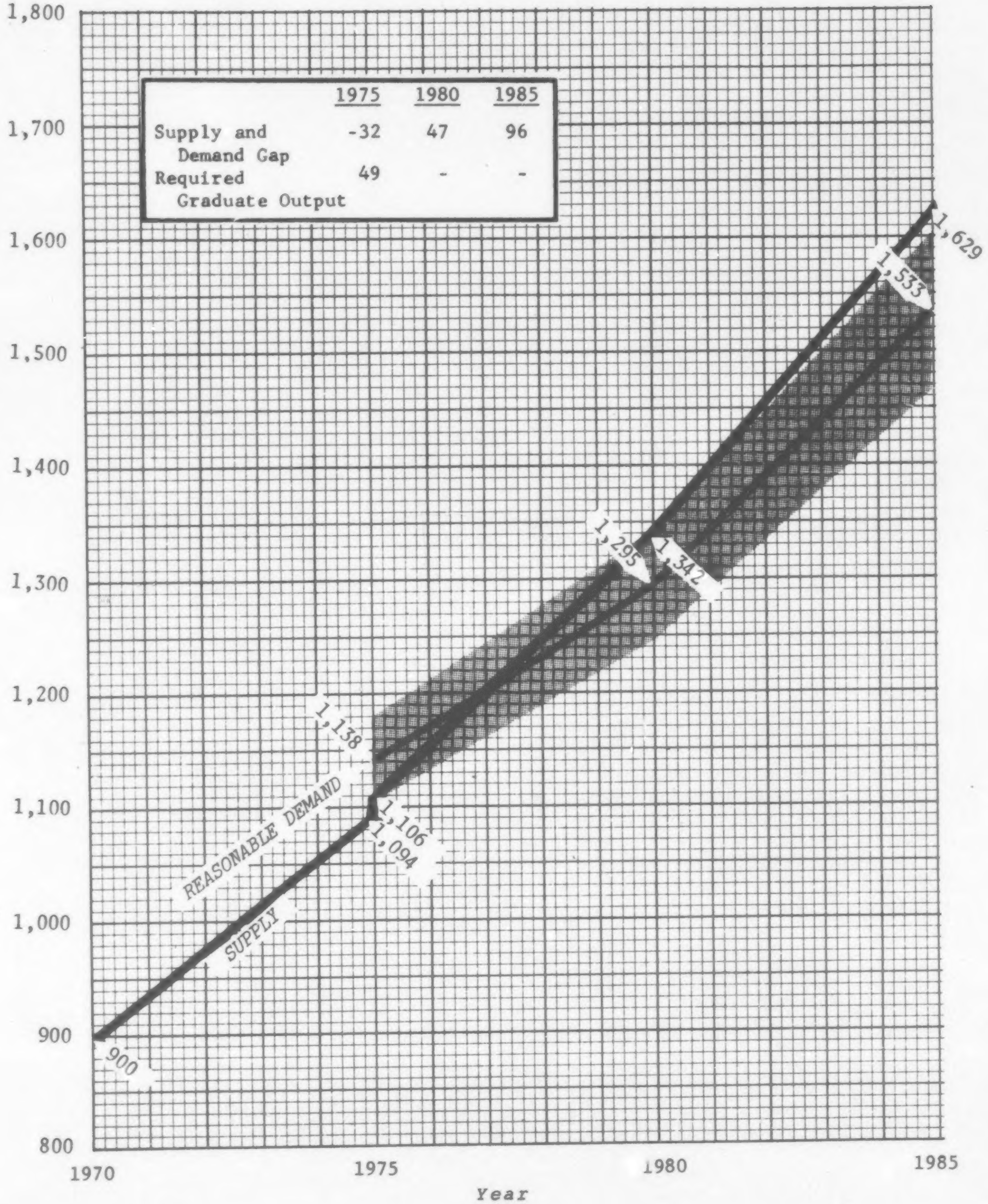
(1) Appendix G, pp. G-7 to 9.

(2) The projected supply does not reflect the graduate output from a combined program approved by the BHE on October 20, 1972, for CMDNJ, Newark State College and Seton Hall. This data was too late for integration into our projections. It is expected that an additional 12 students will graduate from this program. The addition to manpower supply would be 8 manpower units.

MANPOWER GAP: Graph #1

HMOC: Medical Technologists

Statewide Basis: Projection Model #1

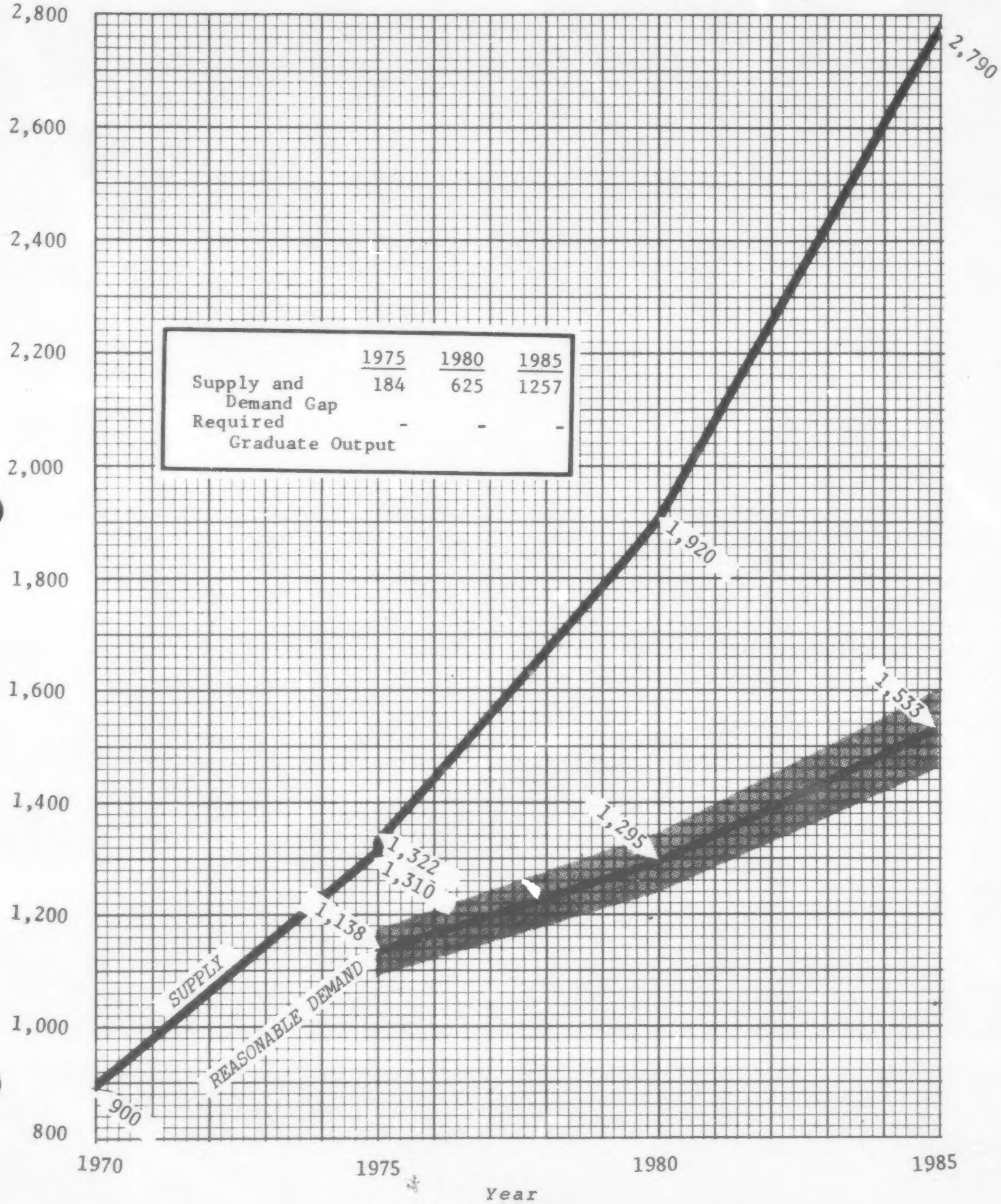


	1975	1980	1985
Supply and Demand Gap	-32	47	96
Required Graduate Output	49	-	-

MANPOWER GAP: Graph #2

HMOC: Medical Technologists

Statewide Basis: Projection Model #2



	1975	1980	1985
Supply and Demand Gap	184	625	1257
Required Graduate Output	-	-	-

Currently, there are nine baccalaureate programs, in seven institutions,(3) in medical technology of which two programs are in Comprehensive Health Planning Area 1, four programs are in Area 2, two programs are in Area 3, and one program is in Area 4. The expected graduate output from these programs and from hospital based programs that train baccalaureate students who have come from other programs and/or other states amounts to 195 students each year. From these programs the gross addition to the labor force would amount to 127 technologists each year.

It seems clear that the projected increase in supply of 8% per year more closely parallels changing supply conditions in the State; however, whether we use the 8% growth factor or the 4% growth factor, both models indicate a growing surplus of medical technologists.

The projections are given added validity because of the growing supply of medical laboratory technicians. There are currently nine MLT programs in the State providing approximately 50 to 60 graduates per year. If these technicians continue to fill the same employment role as the technologists, as they have been doing doing in the past, we would expect a reduction in the demand for medical technologists. This would further increase the expected surplus.

Given, at the worst, the very narrow current gap between the supply and demand lines and the projected over-supply anticipated in the very near future, plus the possibility of further substitution of medical laboratory technicians for technologists, we recommend that:

Recommendation #1 - HPEAC should recommend disapproval of additional programs in medical technology at this time.

While the projections indicate a surplus of medical technologists on a statewide basis, there may well be now and continue to be in the future, a shortage of medical technologists on a regional basis. For this reason it is important to establish a data base from which regional projections can be developed.

Some concern has been expressed to us about the quality of work now being performed in laboratories and about the appropriate utilization of the medical technologist. Miss Janet St. Martin, President of the New Jersey of Medical Technologists, Inc. suggests that:

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(3) This does not include the combined program at CMDNJ, Newark State College and Seton Hall.

> "The New Jersey Society for Medical Technology feels very strongly that the quality of laboratory testing is a direct result of the individual performing the test. We believe that not only do we have too many people working in laboratories who are not qualified but also that our qualified people are not performing at the highest level at which they should be. For example, a fully trained Medical Technologist should be utilized in a supervisory position and not so much at the routine bench. The MLTs (Medical Laboratory Technician) are Associate of Arts degree people who have been specifically trained for two years for routine laboratory bench work. There is an ever-increasing number of these students graduating each year from our community colleges.
>
> "Therefore, we believe the need lies in:
>
> 1. Educating people who are presently not qualified.
>
> 2. Programs established in existing facilities to upgrade the Medical Technologist (management quality control, etc.) Supervisor.
>
> 3. Programs and funds established to give the MLTs and CLAs (Certified Laboratory Assistants) the opportunity to advance in their education - the career ladder concept." (4)

We believe that Miss St. Martin's suggestions are particularly appropriate in that they outline a number of ways of insuring that New Jersey's population will not only have an ample supply of manpower, but that they will also be provided with quality service. Based upon Miss St. Martin's comments we make the following two recommendations:

Recommendation #2 - HPEAC with the aid of both educators and professionals in the field should evaluate, on a continuing basis, the curriculum of medical technology programs at the baccalaureate and A.A.S levels to insure that future graduates are given the training that is necessary to provide New Jersey residents with quality service.

Recommendation #3 - HPEAC should encourage the development of programs for continuing education in medical technology as well as refresher education programs for people who wish to reenter the labor force.

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(4) From a letter received by the Department, October 9, 1972.

MEDICAL LABORATORY TECHNICIANS

The medical laboratory technician is a relatively new health manpower occupational category. Quoting from the Health Manpower Data Project:

> "The technicians usually work under the supervision of the medical technologist, performing at a level between the medical technologists and the certified laboratory assistants. Certification is awarded by the Board of Registry of the American Society of Clinical Pathologists (ASCP) following the successful completion of an examination. Requirements for certification include either an associate degree from a junior college or community college plus supervised training in a clinical pathology laboratory, or graduation from a 12-month military laboratory program with an associate degree or its equivalent."(1)

At this time, it is difficult to assess the State's manpower needs because hard data are not available in order to develop supply and demand projections. We believe, however, that it is important to note that there are nine approved programs in New Jersey training medical technicians. Of the nine, the programs at Bergen Community College and Camden Community College have been approved within the last two years. Furthermore, the programs are distributed within each region of the State. One program is in Comprehensive Health Planning Area 1; two are in Area 2; three are in Area 3; and, three in Area 4.

An estimate of future additions to supply can be developed from the number of graduates from current programs. The graduate output from the nine programs is expected to total approximately 60 students per year. If we apply an in-state survival factor of 80%, we would anticipate a gross addition to supply of approximately 48 manpower units per year or 240 during each projection period.

We are not yet able to determine whether the number, distribution, and production of graduates of current medical laboratory technicians programs in the State are sufficient to meet manpower needs. Moreover, in considering whether new programs should be approved, account should be taken of the recent evolution of this particular HMOC. According to recommendations from national and local professional societies in the medical laboratory field, medical laboratory technicians will be increasingly assuming many functions heretofore carried out by medical technologists. Since this field, as a whole, also is rapidly expanding due to current technological advances, it seems realistic to assume that medical laboratory technicians will be needed in far greater quantity than current practice -- based of necessity on past and present utilization of manpower -- might indicate.

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(1) Appendix G, G-10.

The recent recommendations of the joint Committee of the American Association of Junior Colleges-National Council for Careers in Medical Technology, for the development of new Associate Degree programs, call for more sophisticated and generalized training for medical laboratory technicians than did former programs. We believe they should be heeded. Thus, the quality of these programs in the future will be as significant a factor as their quantity. Further, the placement of graduates from these new programs, their utilization, and the extent to which they assume the functions of other personnel, must all be part of manpower needs projections in the future.

The Department will continue to develop better data based on new or emerging national and local trends and personnel requirements.

We, therefore, recommend that:

Recommendation #1 - Each proposed new program for Medical Laboratory Technicians should be reviewed in the light of the evolution of this particular HMOC and the status of manpower needs and utilization, at the time it is proposed.

CYTOTECHNOLOGISTS

As defined in the Health Manpower Data Project:

"A cytotechnologist is one who stains, mounts and studies cells of the human body to determine pathological conditions. He also examines specimens and diagnoses the nature and the extent of disease or cellular damage by performing a variety of laboratory tests.

"A cytotechnologist receives his training in schools of cytotechnology approved by the AMA Council on Medical Education in collaboration with the American Society of Clinical Pathologists and the American Society of Medical Technologists through its Board of Schools (ASCP)."(1)

The projections were developed on a statewide basis because of the small numbers of personnel and because data were not available for a regional analysis.

The graph on the following page presents the Health Manpower Data Project projections (Appendix G, pp. G-11-12; and Tables 1 and 2, pp. G-2-3). The projections indicate that the current shortage of cytotechnologists will continue to exist until the late 1970's; however, the projections also indicate that the shortage will rapidly give way to a widening surplus.

We should point out that the supply projections, as presented in HMDP, are based upon the assumption that manpower supply will continue to grow at one-third of the national growth rate - that is, the national growth rate between 1965 and 1970 averaged 15% a year, while HMDP assumes a rate of growth of approximately 5% per year.(2) This assumption is required because of the lack of historical data for the State upon which independent estimates of supply trends could be made. A 5% rate of growth will lead to an average absolute net increase in supply of 27 cytotechnologists during each projection period.

There is some indirect evidence that suggests that the HMDP assumption of a 5% growth in supply is a reasonable one. There are two operating programs in the State. One program is located in Comprehensive Health Planning Area 2 at Muhlenberg Hospital, and the second program is located in CHP Area 4 at Atlantic City Hospital. A third program is expected to begin shortly at Martland Hospital in Area 2. It is estimated that the combined graduate output from these programs will be 7 students per year or 35 students during each projection period. If we apply an in-state survival factor of 80% to the graduate output, the gross addition to supply will amount to 28 manpower units each five years. This figure, however, does not include the number of cytotechnologists

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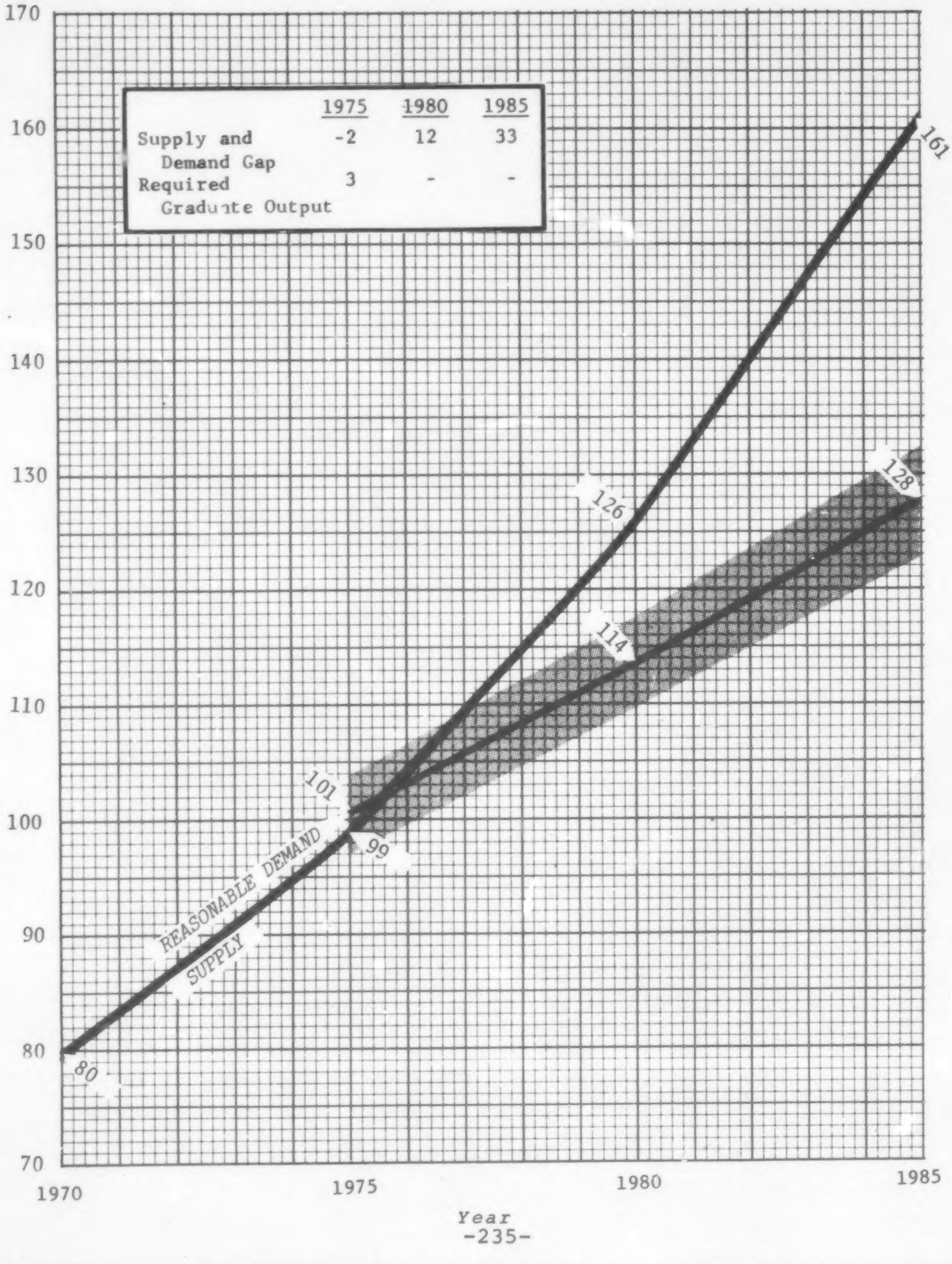
(1) Appendix G, p. G-11.

(2) The assumption of a 15% growth in supply would imply a significantly larger surplus.

MANPOWER GAP: Graph #1

HMOC: Cytotechnologists



	1975	1980	1985
Supply and Demand Gap	-2	12	33
Required Graduate Output	3	-	-

who will move into the State.(3)

Based upon our projections, we believe that programs at the community college level are not warranted at this time, particularly if these programs involve an additional outlay of funds for staff and facilities. We believe, however, that the quality of trained cytotechnologists can be improved through affiliation with community colleges. We, therefore, recommend that:

Recommendation #1 - *Community colleges should explore establishing affiliations with those hospitals within their CHP Areas that currently have programs in cytotechnology, in order to provide an appropriate academic background for such manpower. These colleges should collaborate with the New Jersey Association of Cytotechnologists in order to identify the indicated courses for this purpose.*

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(3) It is estimated that 90% of all cytotechnologists are females and we would therefore expect that interstate migration would tend to be small. Data taken from a letter from Mr. Charles Thompson, Acting President, New Jersey Association of Cytotechnologists.

RADIOLOGIC TECHNOLOGISTS

The supply and demand projections for radiologic technologists identified by the Health Manpower Data Project (HMDP) were broken down into regional planning units. The regional basis of projection appears to be most appropriate since radiologic technologists are presently trained in all four regions. Also, the relative immobility of these personnel and the significant differences in demand among the regions, further substantiates this breakdown.(1) On the following pages, Graphs 1 - 5 summarize the HMDP data in the manner described in the introduction to this chapter. It will be noted that certain of the graphs show upward "jogs" in the supply line to reflect anticipated new graduates from programs approved by the Board of Higher Education since 1970. The additions to the supply lines are adjusted, however, to reflect the 80 percent "in-state survival" factor assumed to apply to this HMOC, also discussed in the introduction to this chapter.

The supply and demand curves for this HMOC are very slightly divergent. The metropolitan region has the largest absolute demand but is the least divergent in relation to supply. In contrast, the central region has less demand, but the largest need gap. On each of the graphs there is inset a table which displays the supply and demand gap adjusted by the "in-state survival" factor to indicate the total output of graduates required to meet anticipated needs for radiologic technologists.

We perceive a need for analysis and recommendations related to the scope of responsibility and educational programs of personnel in this HMOC, and hence offer the following recommendation.

Recommendation #1 - Consideration should be given by colleges presently offering programs in radiologic technology to increase the number of graduates in this field to close the manpower gaps identified by this master plan and, where necessary, new programs should be launched by other colleges to supplement their efforts. In addition, hospital based programs should give serious consideration to incorporating their training plans into existing or future college programs, in order to place them within an academic framework which will promote professional mobility.

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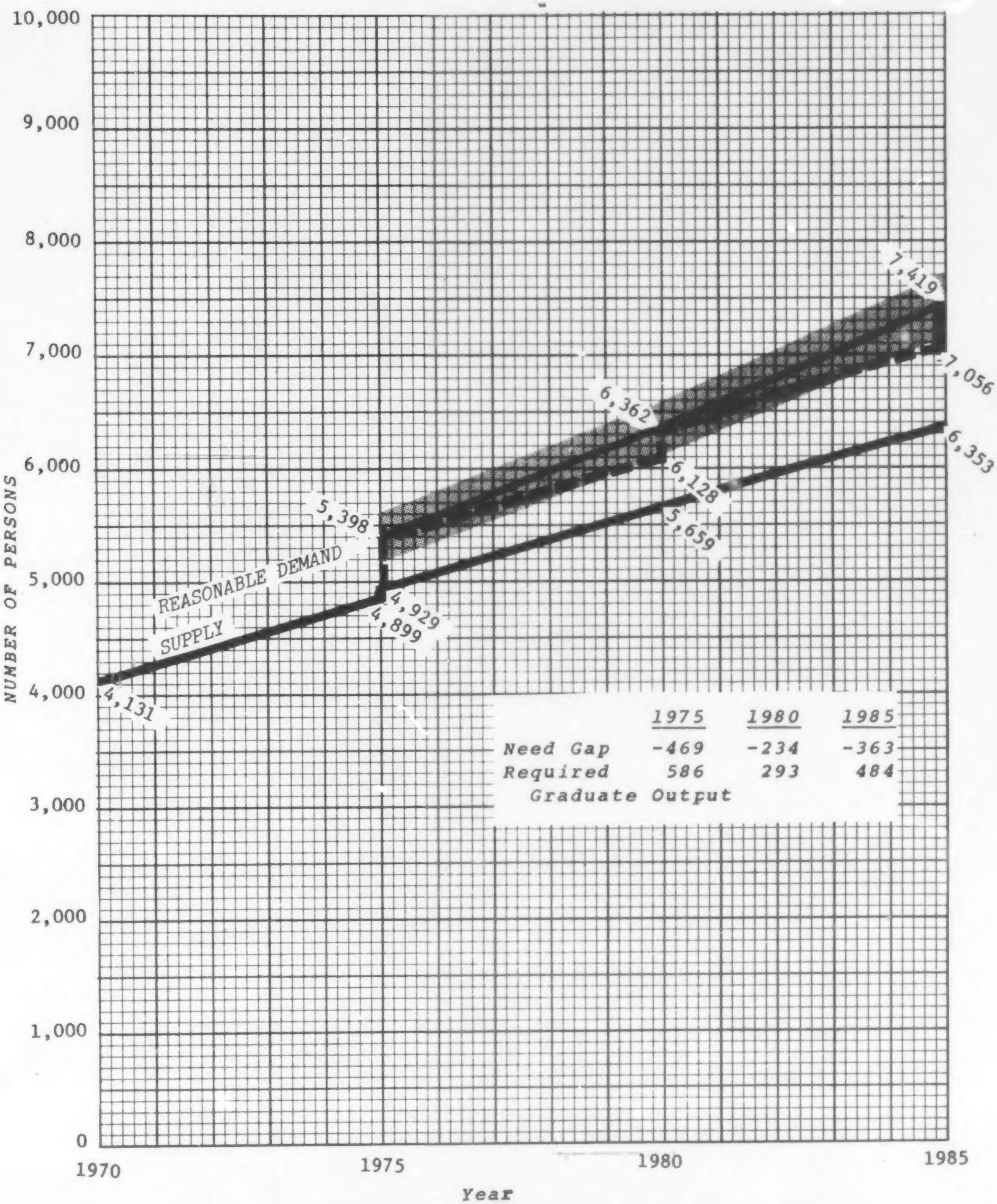
(1) In the radiologic technologist health manpower occupational category, the regional demand totals did not precisely coincide with the statewide demand total. These regional differences were consequently pro-rated on the basis of their demand magnitudes to agree with the state total. See Appendix E, pp. 188-194; also Section 4, Tables 10 and 12, on pp. 72 and 85 respectively.

GRAPH #1
HMOC: Radiologic Technologists

STATEWIDE BASIS

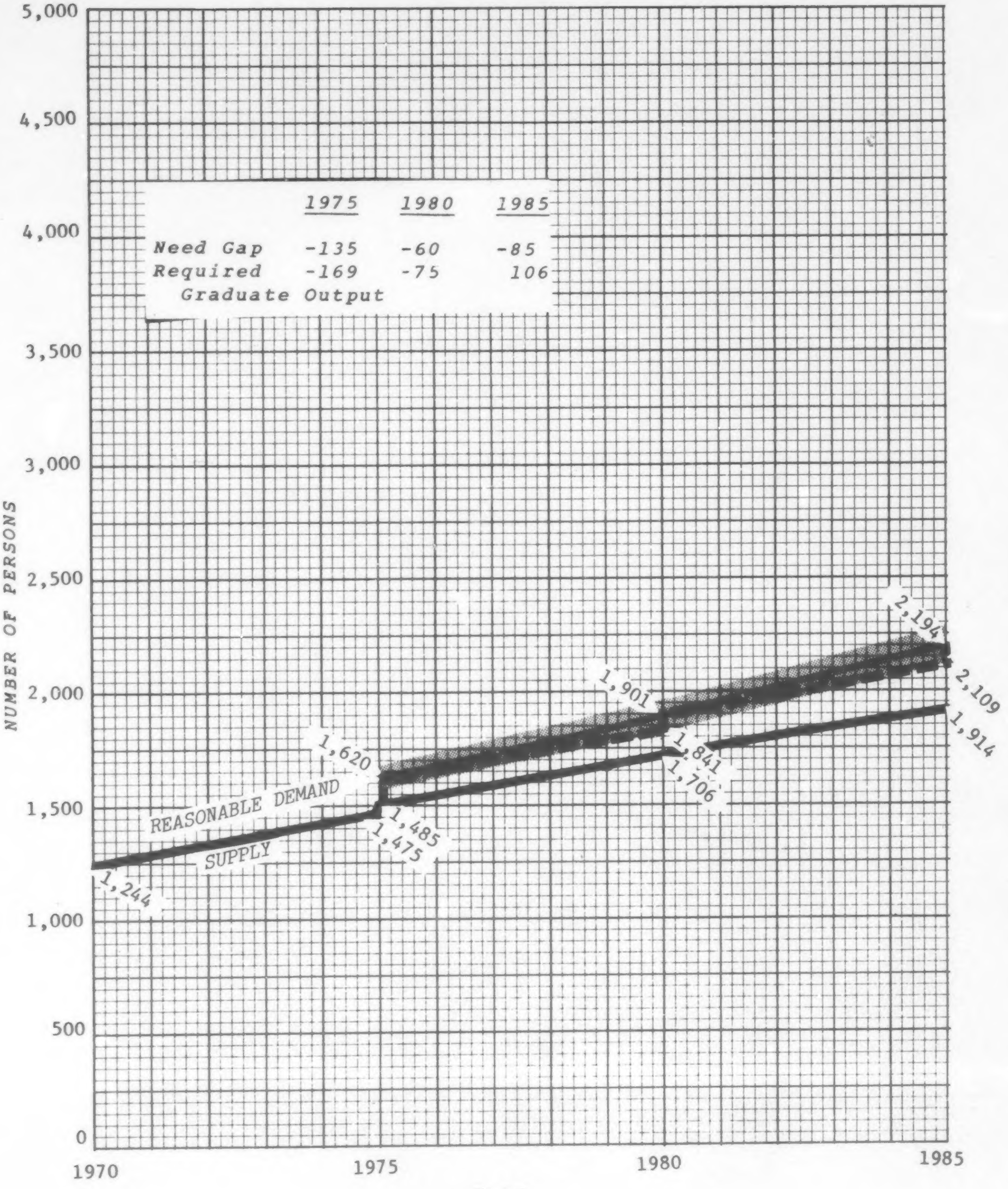


	1975	1980	1985
Need Gap	-469	-234	-363
Required Graduate Output	586	293	484

GRAPH #2

HMOC:Radiologic Technologists

AREA 1

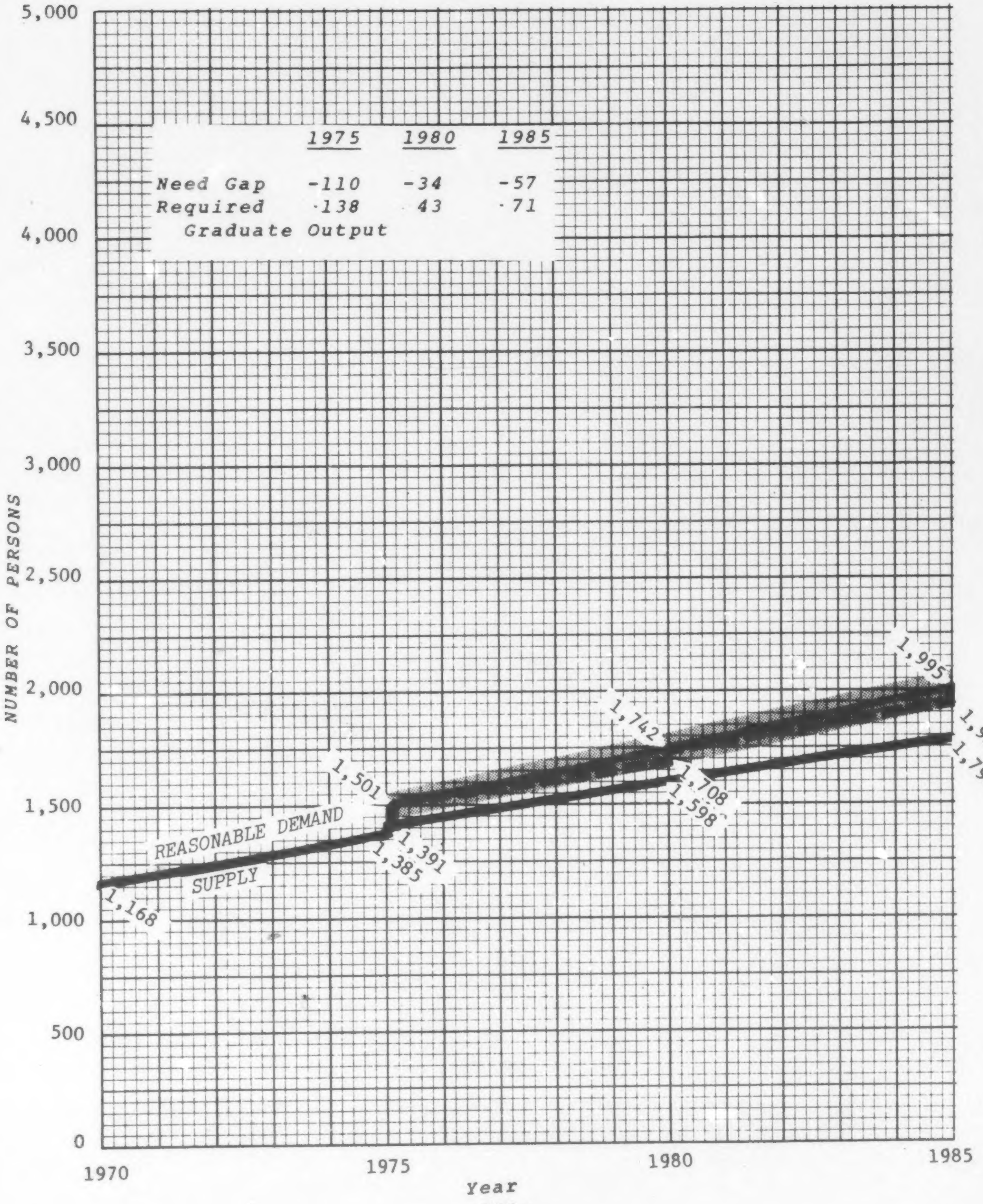


	1975	1980	1985
Need Gap	-135	-60	-85
Required Graduate Output	-169	-75	106

GRAPH #3

HMOC:Radiologic Technologists

AREA 2

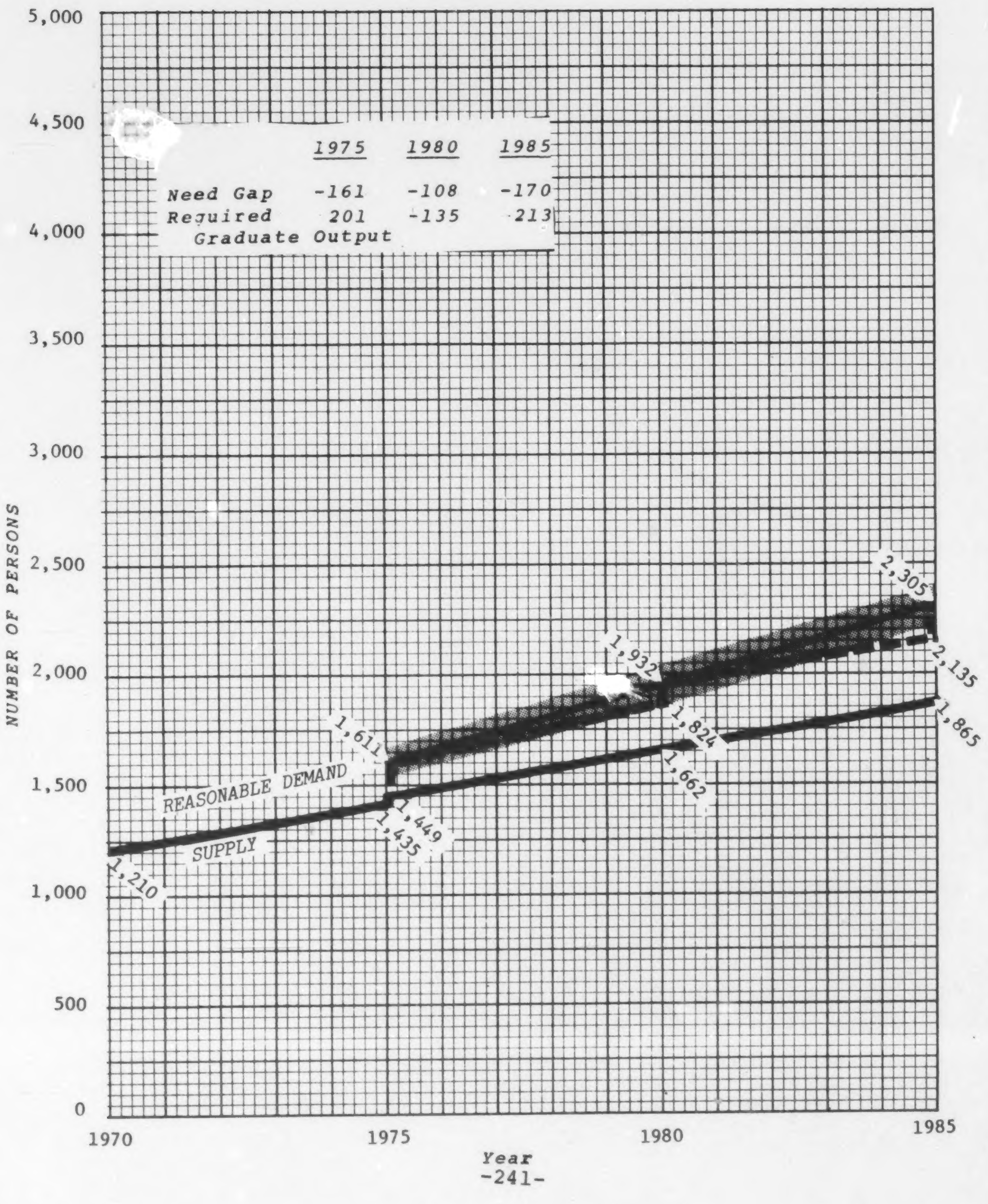


	1975	1980	1985
Need Gap	-110	-34	-57
Required Graduate Output	138	43	71

GRAPH #4

HMOC:Radiologic Technologists

Area 3

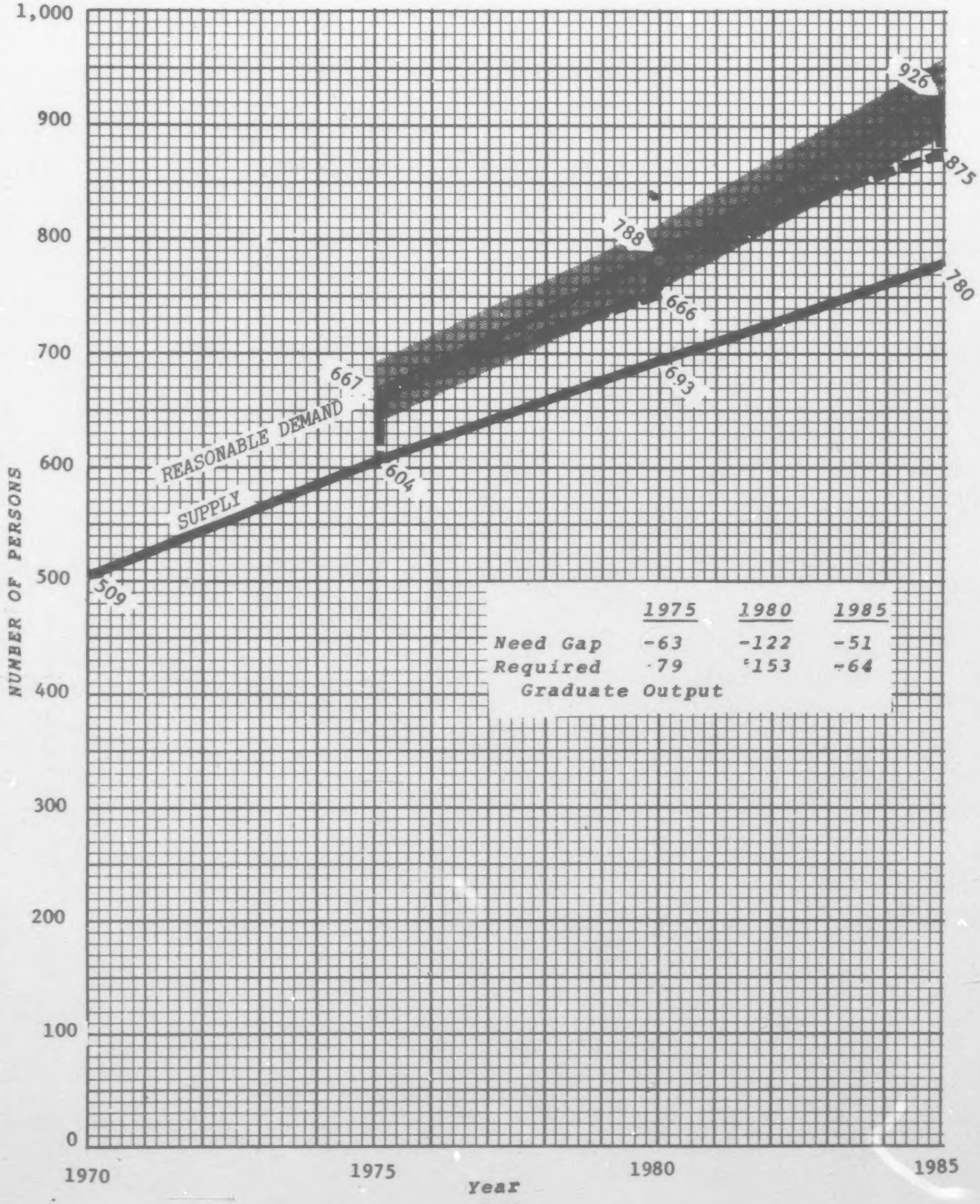


	1975	1980	1985
Need Gap	-161	-108	-170
Required Graduate Output	201	-135	213

GRAPH #5

HMOC:Radiologic Technologists

AREA 4



	1975	1980	1985
Need Gap	-63	-122	-51
Required Graduate Output	79	153	64

RESPIRATORY THERAPISTS AND TECHNICIANS

Quoting from HMDP "Respiratory Therapy is an allied health specialty in the treatment, management, control and care of patients with deficiencies and abnormalities associated with breathing."

"The respiratory therapy specialist must be expert in the therapeutic uses of such aids to the breathing process as medical gases, oxygen administering apparatus, humidification, aerosols, positive pressure ventilation, cardiopulmonary resuscitation and mechanical airways."(1)

As noted in HMDP, the development of projections for this HMOC presents a number of problems because of the basic confusion by employers, professionals and educators as to the educational requirements and employment roles of the various groups of employees that comprise this occupation. The confusion arises because, as Dr. Donald F. Eagan, Director, Section of Chest Diseases, New Britain General Hospital, points out, within a hospital setting:(2)

> "...the term, 'inhalation therapist', usually refers to anyone employed in technical respiratory care, although officially there are two basic levels: one is the inhalation therapist and the other is the inhalation therapy technician.
>
> "...As a general statement it can be said that both levels are clinicallly trained to approximately the same degree but that the inhalation therapist is given additional responsibilities in administration, supervision, technical judgment and a higher level of teaching. It can be further generalized that the bulk of bedside inhalation therapy will be given by trained inhalation therapy technicians under the supervision of inhalation therapists."(3)

The therapist and the technician differ as to formal academic experience. Quoting from Dr. Egan's paper:

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(1) Appendix G, p. G-14.

(2) The occupation is now referred to as "Respiratory Therapists" as initiated by the professional association. The article quoted below retains the original designation. The Board of Registry has not,as yet, changed its designation.

(3) Dr. Donald F. Egan, "What is Inhalation Therapy", Clinical Notes on Respiratory Diseases , Vol. II, No. 2 (National) Tuberculosis and Respiratory Disease Assoc N.Y., 1972) p. 16.

> "The inhalation therapist is a graduate of a two-year cooperative program between a hospital and a community or junior college which rewards the successful student with an associate degree from the college as well as a certificate from the hospital. With a background in both academic and clinical subjects, and after suitable work experience, he or she will be eligible to take the written and oral examination of the American Registry of Inhalation Therapists, Inc., and earn the title Registered Inhalation Therapist (RIT).
>
> "Already operational although still in the organizational stage is the inhalation therapy technical school. This provides a one-year education with a limited but highly selective academic component of basic sciences relative to inhalation therapy, plus a large amount of supervised clinical experience. Such schools are, for the most part, hospital-operated although many are finding it expedient to utilize nearby educational institutions to a limited degree. The inhalation therapy technician, if he or she so desires, may take a proficiency examination known as the Technician Certification Examination. If successfully passed, this designates the technician as a Certified Inhalation Therapy Technician (CITT)." (4)

There is a third manpower category usually classified as aids or assistants. These workers are usually trained on the job and do not require any specialized educational background. For these reasons, they have not been included in our projections or in our analysis.

From the data presented in HMDP (Appendix G, pp. G-14-16, and Tables 1 and 2, pp. G-2-3) and from information supplied to us by Mr. David W. MacDonald, two projection models are developed. The first model projects the supply and demand for registered respiratory therapists, while the second model projects the supply and demand for registry eligible therapists and all technicians. Unfortunately, the available data did not allow us to project supply and demand for each group separately.

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(4) Ibid, pp. 6-7. We have been informed by Mr. David W. MacDonald, Chairman, Board of Directors, N.J. Chapter, American Association for Respiratory Therapy, that by 1975, the American Association for Respiratory Therapy will require that all technicians must sit for the examination in order to obtain the minimum level of comptency (CITT).

Both projections are estimated on a statewide basis because of the small number of personnel in this Health Manpower Occupational Category. Furthermore, reliable data are not available for a regional analysis.

In projection model #1, presented in graph #1, the supply of registered therapists is assumed to grow at 5 per projection period. This assumption is based upon historical data which indicates a growth in supply of one per year. The supply line is further increased to account for the net addition to the labor force from the newly approved programs at Bergen Community College and Brookdale Community College.

The demand projections for registered respiratory therapists follow the HMDP methodology. Demand is projected on the basis of the expected increase in hospital utilization due to increases in income and population. Demand is further adjusted for current unmet needs and the average effect of national health insurance.

If the new programs at Bergen and Brookdale are to receive AMA approval, they are required to have registered therapists on their staff. It is, therefore, assumed that these programs would require a total of five registered therapists. The factor is then added to the demand projections.

There are some who believe that there will be considerable expansion into other areas of the activity of therapists in the future. Mr. David MacDonald believes that the therapist is currently being underutilized. He suggests that "the trend for the future is to have them become involved in electrocardiography, vectorcardiography, phonocardiography,...and heart lung machine." (5)

It has been further suggested by Dr. Norman Edelman (Assistant Professor, Chief of Pulmonary Medicine, Rutgers Medical School) that increased demand will come about from their involvement in chest physiotherapy and respiratory disease function studies.(5)

If such expanded duties utilization does take place, it will obviously increase the productivity and the demand for registered therapists. In order to account for this factor, we assumed a 10% increase in productivity. We point, out, however, that the 10% factor was quite arbitrary because the necessary data that were needed to determine productivity trends were not available. It was possible that the true adjustment could be larger or smaller than 10%. Obviously, this could affect our demand projections and the educational policies that are developed from them.

The projections in graph #1, and its inset table, indicate that the supply and the demand for registered therapists tend to diverge, with supply growing at a more rapid rate than demand, indicating a growing surplus even though we added to the demand educational needs and a productivity factor.

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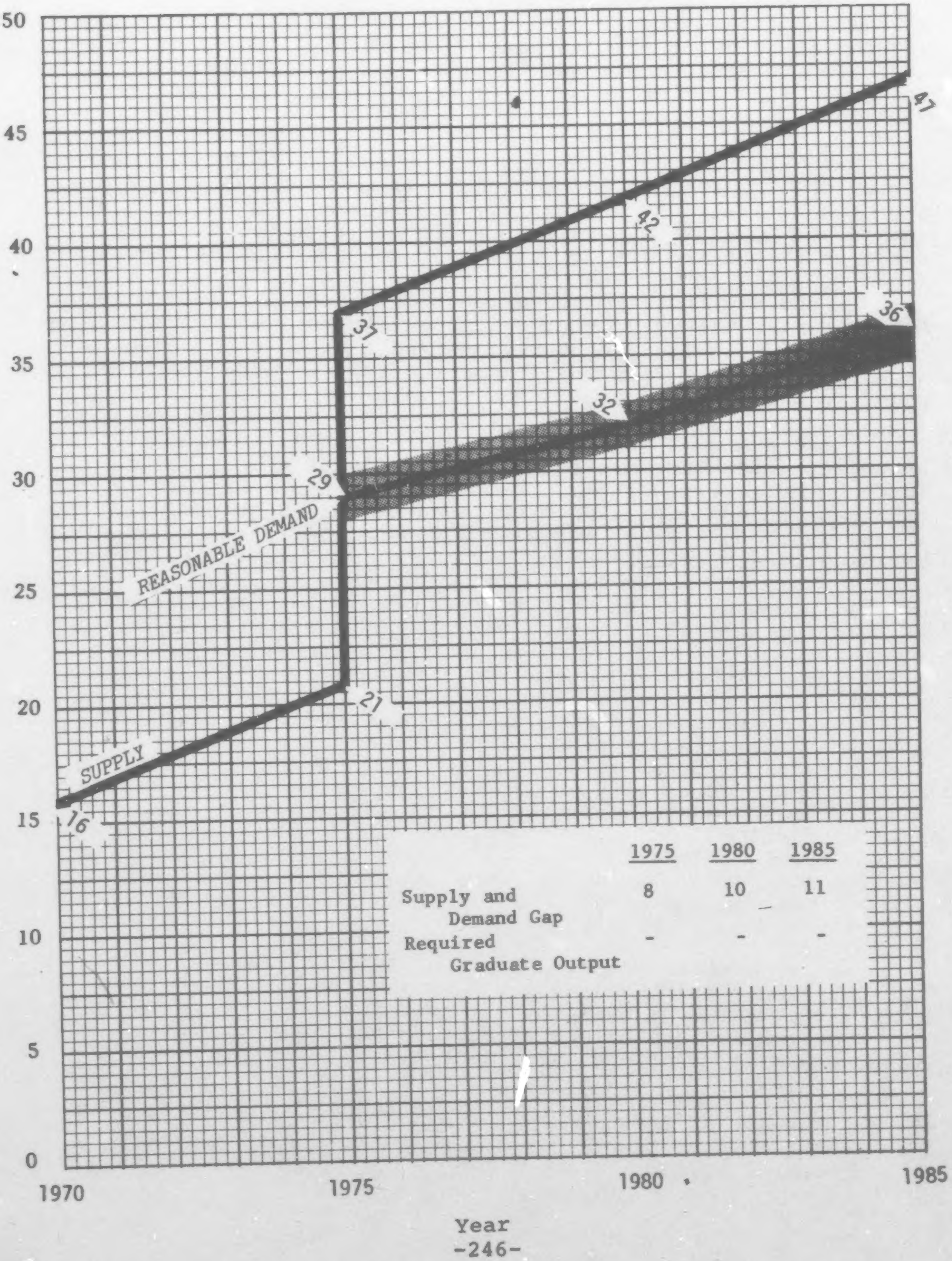
(5) From a letter received by the Department, October 2, 1972.

(6) From a telephone conversation with Dr. Norman Edelman, October , 1972.

MANPOWER GAP: Graph #1
HMOC: Respiratory Therapists
and Technicians
Statewide Basis-PROJECTION
MODEL I



	1975	1980	1985
Supply and Demand Gap	8	10	11
Required Graduate Output	-	-	-

In projection model #2, presented in graph #2, we project supply and demand for a composite group of manpower, including registry eligible therapists, certified respiratory technicians and certified eligible technicians. Since historical data are not available in order to determine past trends in supply, we assume that manpower supply would grow at the same rate as the supply of registered therapists.

Data supplied by the American Association of Respiratory Therapy indicates that there are currently 208 active members in the Association. Of the 208 active members, 18 are registered therapists and 190 are technicians and registry eligible therapists. It is assumed that the ratio of 10.5 technicians and eligible therapists to 1 registered therapist (190/18) existed during the base year. This assumption implies that the base year supply of technicians and registry eligible therapists was 162. Furthermore, if the projected net increase in the supply of therapists is assumed to amount to 5 per projection period, our assumption implies that the net increase in the supply of technicians and eligible therapists is 10.5 times that net increase or a total increase in supply of 53 manpower units per projection period.

The demand for this group is projected using the HMDP methodology as discussed above. The results of these projections are presented in graph #2. They indicate a growing surplus of technicians.

It should be noticed that the combined projected net increase in the supply of therapists and technicians between 1970 and 1975 is estimated to be 74 manpower units.(7) As a check against this projection, we estimated the graduate output from all programs in respiratory therapy. From the current operating programs, we expect a graduate output of 44 students per year and from the new programs, we estimate an additional graduate output of 26 students per year. Adjusting both figures for an in-state survival factor of 80%, the expected gross addition to supply would be 56 manpower units per year. Clearly, the actual gross additions to supply are substantially higher than our projected net additions. If we were to adjust our supply projections to reflect both current and expected graduate output as well as in-state migration, the projected surpluses for both categories would be much larger.

Both projection models indicate a growing surplus of respiratory therapists and, therefore, we would conclude that no additional educational programs are needed at this time. However, since this section was included in the Revised Draft, a number of issues have been raised concerning the application of our projection methodology to this HMOC. It was felt that the occupation was changing very

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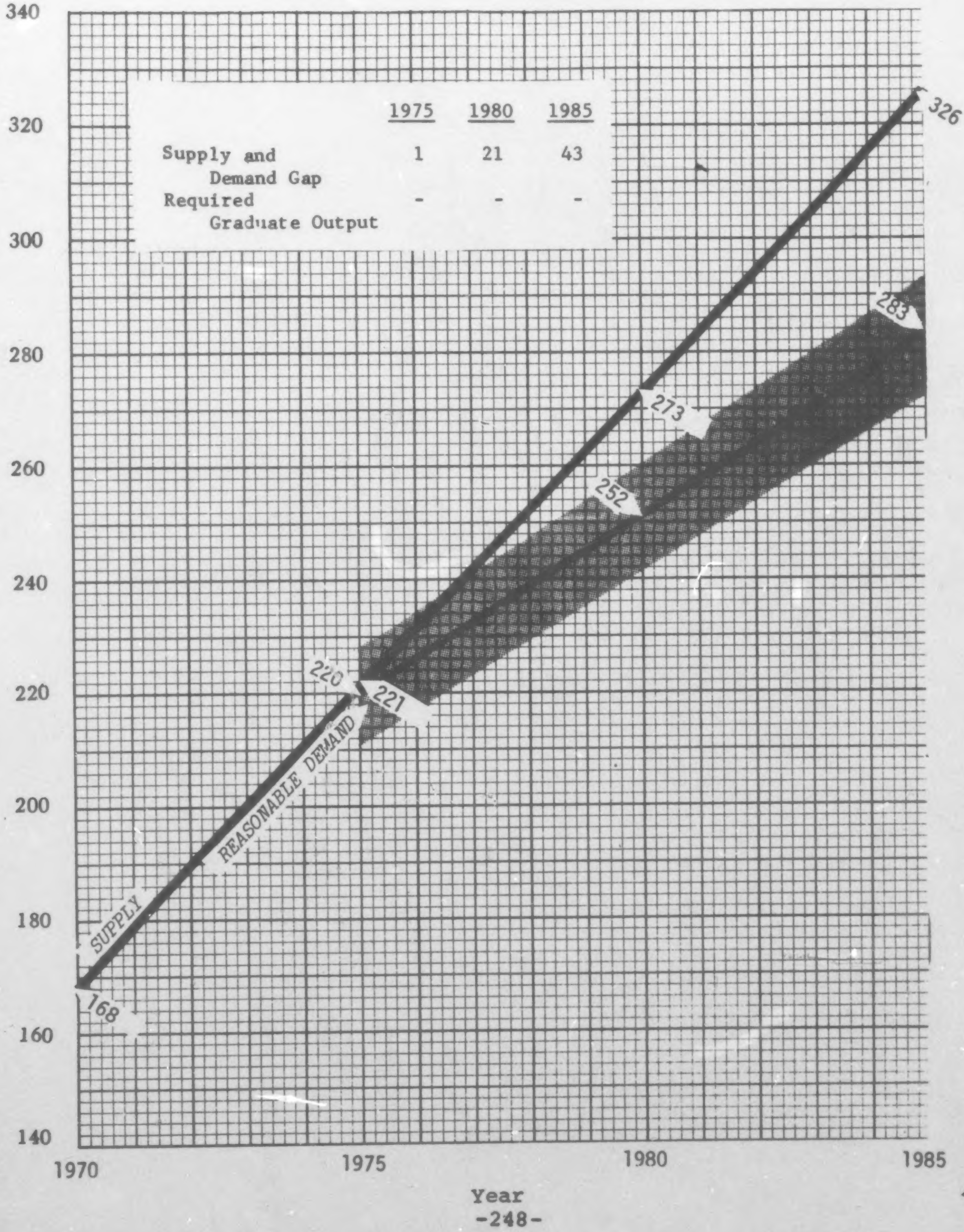
(7) This figure is based upon the projected increase of 5 registered therapists, 53 technicians and 16 graduates from new programs.

MANPOWER GAP: Graph #2
HMOC: Respiratory Therapists
and Technicians
Statewide Basis-PROJECTION
MODEL II



	1975	1980	1985
Supply and Demand Gap	1	21	43
Required Graduate Output	-	-	-

rapidly and, therefore, the projections may not be a valid indication of future employment market situations. At the same time others felt that the current clinical shortage of registered therapists was not due to an inadequate number of programs but it was due to a 75% failure rate on the registry exam.

In response to the above concerns an ad hoc HPEAC Subcommittee was formed to examine the manpower needs for this HMOC. It was the consensus of the Subcommittee that the need for respiratory therapists is unclear for the following reasons:

1. The profession is very young and in a state of flux.

2. Many people are currently allowed to perform these services (therapists, technicians, licensed practical nurses and registered nurses). However, the committee itself felt that the current staffing practice of using non-respiratory therapy personnel may not provide for adequate service.

3. While the failure rate on the registry examination appears to be excessively high the reasons for this were unclear.

In view of the many unanswered questions and because we think it wise to develop a reasonable approach in evaluating the question of need for these health professionals, we make the following recommendations:

Recommendation #1 - *Because of the lack of clarity regarding the need for manpower in this HMOC, HPEAC should exercise caution before it recommends the approval of new programs.*

Recommendation #2 - *HPEAC should immediately establish a task force to develop quality standards for current programs in the Respiratory Therapy field and, where appropriate, suggest the necessary curriculum changes. These standards should be consistent with the guidelines established by The Joint Review Committee for Respiratory Therapy Education. In addition, this task force should work with the appropriate certification agencies to ascertain whether the examination for credentialing personnel in the field is appropriate to the needs of the employment market.*

Recommendation #3 - *HPEAC and its task force should continue to solicit input from professionals and educators as to the changing role that the therapist is playing on the health team. Furthermore, HPEAC should continue to monitor, on a regular basis, the supply and demand for personnel in the respiratory therapy field in order to evaluate State and area wide needs.*

OCCUPATIONAL THERAPISTS

The HMOC of occupational therapists is being reviewed on a statewide basis in consideration of the very small pool of personnel involved, and the fact that at present no programs exist to train occupational therapists in the entire State. Any program launched would undoubtedly be looked to as serving statewide needs.

The graph on the following page visualizes the data drawn from the HMDP (Appendix E, pp. 182-187, as well as from Section 4, Tables 10 and 12, on pp. 72 and 85 respectively). The configuration of the occupational therapist supply and demand projections is characterized as divergent. However, since the magnitude of personnel involved is small, possible projection errors would warrant a cautious program strategy to close the manpower gap. Even adjusting the supply and demand gap by the 65 percent "in-state survival" factor described in the introductory portion of this chapter, does not indicate an aggressive program approach is required. The existence of four well-established programs in New York City and Philadelphia likewise militates against launching more than a single, initially modest effort in the State until further experience is gained.

We are not aware of any fundamental problems in the practice setting of occupational therapy at the present time requiring analysis in this context. We therefore make the following sole recommendation:

Recommendation #1 - In considering establishing a program in occupational therapy in the State the colleges, the Health Professions Education Advisory Council, and the Department must fully deliberate its possible location in the context of the regionalization, area health education consortia, and program clustering recommendations made in Chapter VI. In all probability, moreover, the establishment of a single program will suffice to meet the State's future needs.

We likewise believe that in approving the establishment of such an occupational therapy program, the following advice received by the Department from the Director, Professional Educational Services, American Occupational Therapy Association, Virginia T. Kilburn, should be adhered to: (1)

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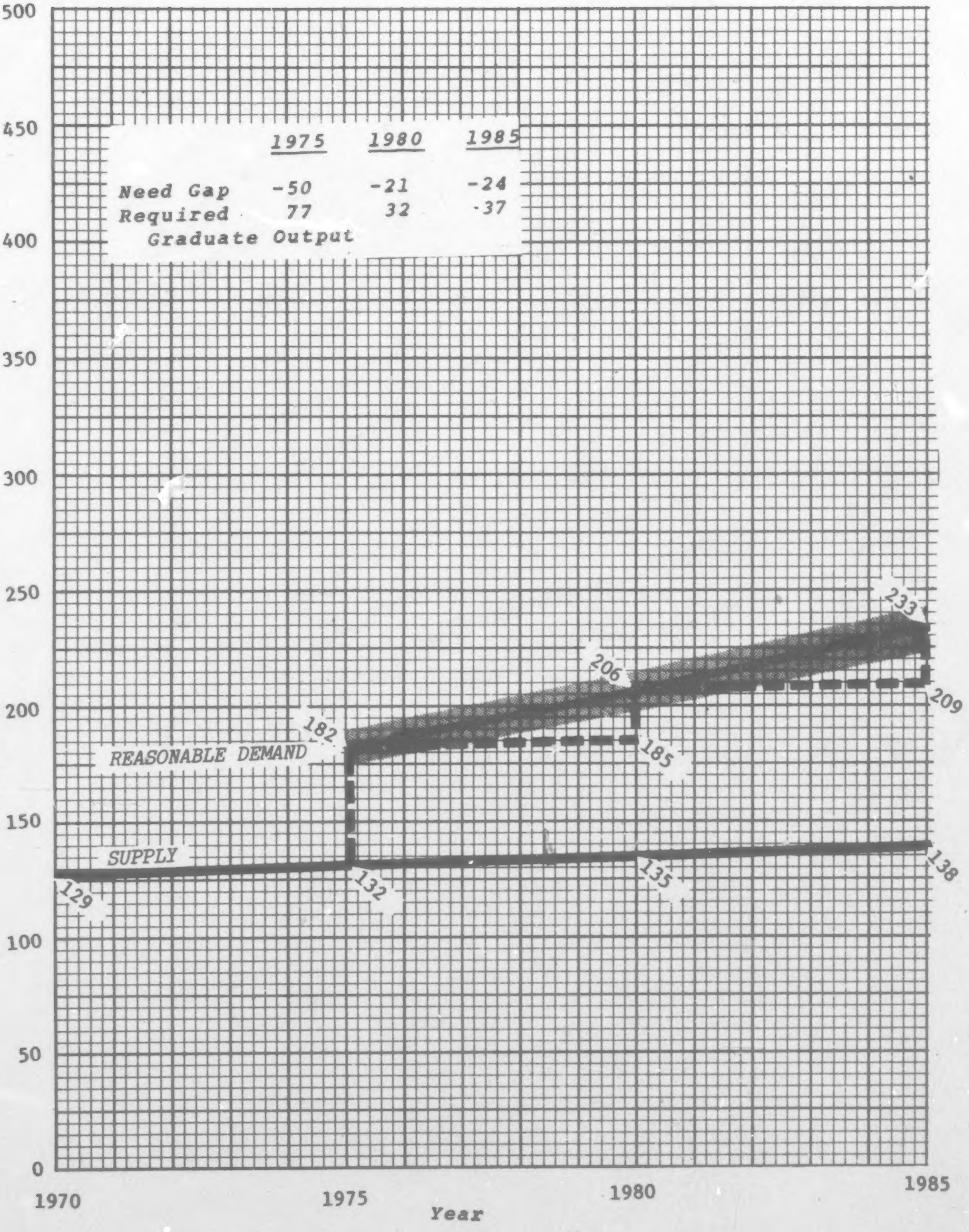
(1) Contained in a letter of February 11, 1971 to the Department.

GRAPH #1
HMOC: Occupational Therapists

STATEWIDE BASIS



	1975	1980	1985
Need Gap	-50	-21	-24
Required Graduate Output	77	32	37

"It is urged that curricula be established only in those institutions having a medical school or which are in close proximity to and affiliated with large teaching hospitals offering services to all types of patients. With increasing emphasis on clinical teaching (including patient demonstrations) it is imperative that physicians be available for presentation of such clinical subjects as general medicine and surgery, neurology, orthopedics, pediatrics, psychiatry and sensory disturbances. There should be locally available well-staffed occupational therapy clinics where students may have observational and other pre-clinical experiences during the didactic program prior to the required months of full-time clinical assignment. Local occupational therapy clinicians should be encouraged to participate in the courses in occupational therapy theory (evaluation and treatment techniques)."

PHYSICAL THERAPISTS

The physical therapy HMOC was projected in the Department of Health's HMDP with two fundamental demand variations. (See Appendix E, pp. 169-181; also Section 4, Tables 10 and 12, pp. 72 and 85 respectively.) The second and slightly larger demand estimate was chosen because it better reflects the extent to which physical therapists are employed in settings other than the hospital environment. These alternative employment settings are expanding, moreover.

Both the supply and demand projections required an adjustment because the base year supply estimate that was used in the HMDP analysis did not take into account that proportion of registered therapists who were inactive. Data from the American Physical Therapy Association indicated that 28% of New Jersey's membership was either inactive or part-time active. Based upon this information, two assumptions were made.

It was assumed that three-quarters of all those who were in this category were inactive in the sense of performing no work at all. This assumption was that this percentage was valid for the entire population of registered physical therapists. The adjusted supply and demand projections are presented in graph #1.

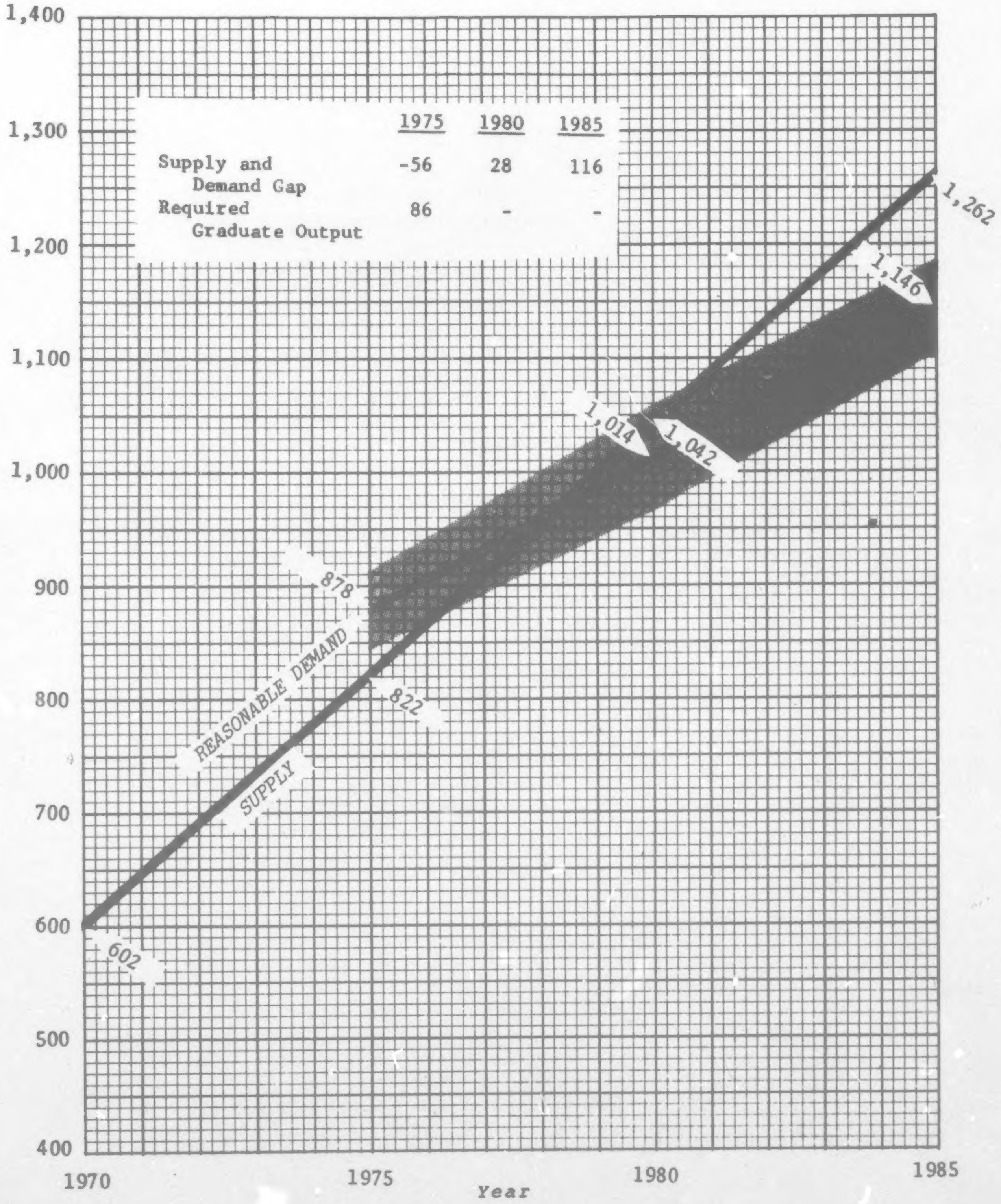
The physical therapy projections are presented only on a statewide planning basis since there are currently no training programs in the State. This argues that should a program be launched, it must take overall New Jersey needs into account. The graph on the following page shows that these supply and demand projections form convergent curves. This is illustrated by the meeting of the supply and reasonable demand curves shortly after 1978. Such a situation would suggest implementation of either a very flexible program which could be scaled down to a diminishing output in the years ahead, or possibly a stratagem for immediately attracting additional personnel from other states. While the table inset onto the graph indicates the number of additional personnel who would be required to adjust for the "in-state survival" factor of 65 percent for this field, it should be noted that this would apply only if it were decided to launch a physical therapy program in New Jersey.

Given the convergent configuration of the supply and demand curves, we have not constructed a proposed strategy line to close the rapidly diminishing manpower gap. In addition to six existent schools in New York State, two in Philadelphia, and one in Connecticut, two additional schools were recently approved for the first two areas. We therefore are led to make the following recommendation:

MANPOWER GAP: Graph #1

HMOC: Physical Therapists

Statewide Basis



	1975	1980	1985
Supply and Demand Gap	-56	28	116
Required Graduate Output	86	-	-

Recommendation #1 - *There appears to be no need to launch a program in physical therapy in New Jersey at the present time. Any program launched would rapidly exacerbate an anticipated oversupply of personnel in this field. Although there exist absolute personnel shortages at present, they are rapidly disappearing. In this field it would appear appropriate to assign the responsibility to employers to find ways to fill their immediate requirements, rather than ask the higher education community to divert resources from more needy fields.*

SPEECH PATHOLOGISTS AND AUDIOLOGISTS

Quoting from the Health Manpower Data Project (HMDP):

"Speech pathologists and audiologists are concerned with disorders in the production, reception and perception of speech and language. They help to identify persons who have such disorders and to determine the etiology, history and severity of specific disorders through interviews and special tests. They facilitate optimal treatment of speech, hearing and language difficulties through remedial or conversational procedures, counseling and guidance. They also make appropriate referrals for medical and other professional attention.

"Speech pathologists are concerned primarily with speech and language disorders and audiologists with hearing problems. Speech and hearing, however, are so interrelated that to be competent in either of these occupations, one must have a familiarity with both. The speech pathologist works with children and adults who have speech, language and voice problems resulting from brain injury, cleft palate, mental retardation, emotional problems, foreign dialect, or other causes. The audiologist also works with children and adults, but is concerned primarily with the assessment and treatment of hearing problems such as those caused by certain otological or neurological disturbances."(1)

The projections for this HMOC were developed on a statewide basis because data for a regional analysis were not available.

The graph on the following page presents the HMDP projections (Appendix G, pp. G-17-20, and Tables 1 and 2, pp. G-2-3). The projections indicate a current and future shortage of speech pathologists and audiologists; however, the projections also indicate that the supply and demand lines tend to converge, with the need gap gradually diminishing in time.(2)

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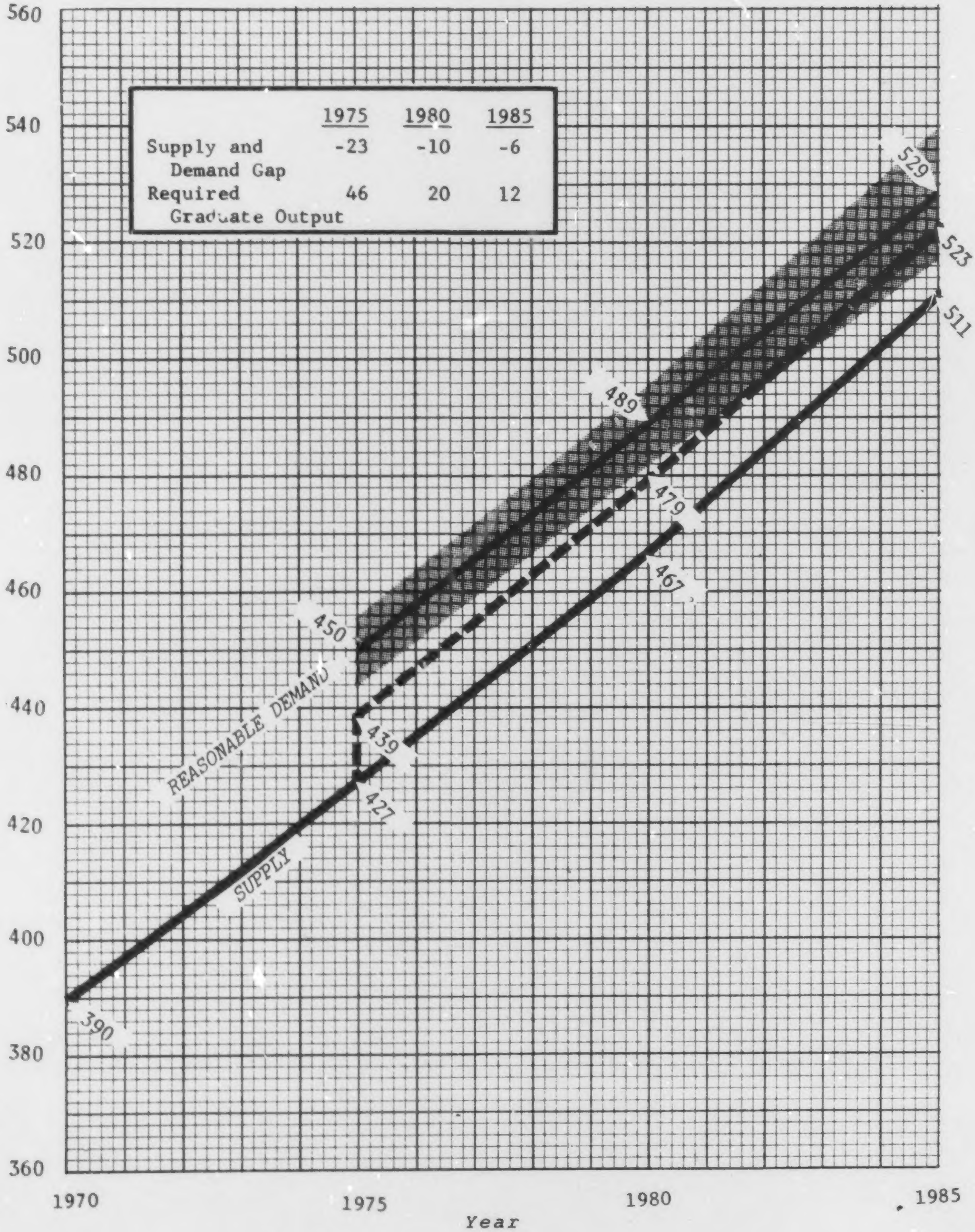
(1) Appendix G, p. G-17.

(2) Since the HMDP base year supply of 487 is based upon membership in the American Speech and Hearing Association, the projections probably understate the expected increase in supply and demand because the number of people employed is likely to be greater than the number of people who belong to the association. This, however, would not change the projections of a diminishing need gap because both the supply and demand estimates would have to be increased by the same adjustment factor to compensate for the discrepancy between the actual base year supply based upon total employment and the assumed base year supply based upon ASHA membership.

MANPOWER GAP: Graph #1

HMOC: Speech Pathologists &
Audiologists



	1975	1980	1985
Supply and Demand Gap	-23	-10	-6
Required Graduate Output	46	20	12

Currently, there are four programs in speech pathology in the State. Two master's degree programs are in Comprehensive Health Planning (CHP) Area 2 at Montclair State College in Essex County, and at Newark State College in Union County. The other two programs are in CHP Area 3 at Trenton State College in Mercer County, and at Douglass College in Middlesex County. The combined graduate output from these four programs has averaged about 50 students per year. These programs add approximately 25 manpower units to supply each year if we assume an in-state survival factor of 50%.

There are some professionals and educators in the field who believe that the State must move in the direction of additional programs at the master's level. For example, Dr. William O. Jones, Chairman of the Department of Speech Pathology and Audiology at Trenton State College suggests that:

> "...there are strong indications that speech pathologists will be licensed in the near future. The indications are that the guidelines for such licensing will include the same requirements as are currently used by the American Speech and Hearing Association for the Certificate of Clinical Competence in Speech Pathology. This will have a definite impact on the training programs since such requirements require a master's degree or equivalent..."(3)

We agree with Dr. Jones' comments and we believe that additional programs in speech pathology and audiology seem justified at this time. We therefore recommend a strategy, as seen by the dotted line on the graph, of closing the need gap by one-half in 1975. Given the in-state survival factor of 50%, we would have to produce an additional 24 students in order to add the required 12 manpower units to supply. The proposed strategy would, however, lead to a rapid elimination of the need gap. Therefore, we recommend that:

Recommendation #1 - *One or possibly two additional programs in speech pathology and audiology should be established. Furthermore, in order to eliminate the regional imbalance of programs, the new programs should preferably be located in CHP Area 1 and/or CHP Area 4. The availability of qualitative centers engaged in activity in this field, to provide appropriate field experiences, also must be considered in determining the location of new programs, however.*

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(3) From a letter received by the Department, October 24, 1972.

HEALTH CARE MANAGERS

During the early period when this plan was being formulated, we solicited opinion on the priority of the HMOCs we should address. A communication was received from Mrs. Anne R. Somers, who has since joined the staff of the Department of Community Medicine of the Rutgers Medical School-CMDNJ. Mrs. Somers advised that:

> "...if you should ask me what single health occupation is in the most crucial short supply today in New Jersey, I would say unequivocally, administrative and planning personnel. I don't mean relatively low level administrative occupations such as [are found in the] 'ancillary administrative' category. I mean men and women capable of organizing and running an HMO, a neighborhood health center, a family planning clinic, an assistant administrator or personnel director at a hospital, or capable of filling any number of relatively high level administrative, planning and fiscal jobs in the growing number of public and private agencies in the State concerned with health care."

As we understand this proposed personnel category, what is referred to are experienced graduates of business administration or management science programs who can apply their skills to the health care delivery environment rather than business or industrial settings. Because such personnel needs are in many cases only now emerging, as well as the insufficiency of data available to identify the current manpower pool, the HMDP does not address this occupational category. Nor do we offer any supply, demand or need projections at this time. Nevertheless, on the basis of the support Mrs. Somers' remarks receive from many health providers and administrators, there appears justification to initiate exploratory programs to prepare personnel for such activities.

What would appear indicated is the establishment of creative management science programs which are at once sufficiently focused to prepare students for specific managerial duties in health delivery agencies, while adequately grounding them in the general principles of management so as to provide broader employment opportunities.

It is our belief that no program of this nature should be launched which does not benefit from the resources and complementary input of institutions with strengths in management science on the one hand, and health delivery experience on the other. A possible approach to such a joint educational enterprise might consist of the completion of three to four years in a strong management science program offering as an option course sequences related to health economics and delivery, followed by a rotating administrative internship of perhaps a year under the supervision of a health delivery institution.

Until such time as clearer definitions of need in this HMOC are available, however, activities in this area should be pursued modestly. It is considered unlikely that many new positions in hospital administration will be created in the State since new hospitals are not being built in any numbers and some hospitals are presently underutilized. The Somers recommendation, moreover, should not be construed as meaning that the state needs to initiate its own hospital administration programs. Rather, existing programs of business and public administration, planning, urban studies and management should be modified to offer interdisciplinary options in Health Care Management.

These programs could possibly be offered at the Associate, Baccalaureate, or Master's degree level. Graduates of such programs might serve as administrators of health care clinics, student health centers, or nursing homes and voluntary health agencies. Health Insurance carriers, state government departments, such as Health or Institutions and Agencies would also be feasible employing locations. It is thought likely that cities may soon consolidate the various health activities under one rubric; graduates of health care manager programs also might appropriately staff such organizations. At another level, graduates may manage specific hospital departments, such as ambulatory care, the admitting office, or, at still another level, may serve as managers of hospital nursing stations or private offices. Whereas a master's degree program might prepare personnel for middle management positions and those involving the administration of smaller health organizations, the managers of small offices or neighborhood health centers might be prepared in a baccalaureate program, and the graduates of an associate degree program could manage hospital departments and health care offices. Indeed, it is possible that programs with two different orientations are being discussed: i.e., those with a public health or epidemiological focus; and those with a social policy orientation.

Curricula of such programs should encompass health care organization, administration, and understanding of society's need for new vehicles for health care delivery, and could include aspects of health related to business administration, law, economics, computer operations, demography, labor relations, health insurance, and social and natural sciences.

However, because there is not general consensus about the appropriate degree necessary for preparation for particular job titles, and in the interest of discouraging the proliferation of job titles, this section of the master plan will address only the broad field of Health Care Manager and recommend that no more specifice categories be recognized at this time.

There also does not exist general consensus regarding the availability of positions at the lowest, or "entry" level. Only a few hospitals in the State have even attempted to introduce this concept, and there has not been general acceptance by nurses, unit clerks or hospital administrators. Moreover, those few places using such personnel have mounted on-the-job training programs to provide the needed medical and hospital background.

It is therefore recommended that:

Recommendation #1 - The HPEAC should designate a representative study group to determine if there exist potential (long-range) alternative roles for health care managers and to recommend the size, quantity and nature of appropriate educational programs to encompass these different emphases for health care managers. As part of this study, analysis should be made of what utilization is being made in New Jersey of graduates of existent hospital administration programs, and the implications for any health care manager programs launched at the masters level in the state. Task analyses of the administrative functions performed in health delivery facilities should be examined, and determinations made generally as to the proper educational levels required for graduates to perform these jobs competently.

There appears to be sufficient evidence, however, that need does exist currently for such graduates and there are several types of employment opportunities for which appropriately educated personnel cannot be found. In order to assure that students have minimal opportunity to select programs ascending to their needs and abilities, and in order to insure that providers of health care have a variety of graduates from which to select for employment, it is further recommended that:

Recommendation #2 - In the immediate future, the HPEAC should review and consider approving a limited number of program proposals for Health Care Managers, even while the study in Recommendation #1 is being conducted. The HPEAC should review such proposals not only on the basis of the special qualities foreseen among their graduates, but also with respect to their provision of alternative types of educational and employment opportunities. Criteria for these alternative educational opportunities should include (1) the level of the program; (2) the emphasis or objectives of the employment situation; and (3) differing internship opportunities. Follow-up evaluation of the utilization and employment of the graduates of all programs should be incorporated.

Because there are many people in managerial positions in the health care institutions who have entered their present level via inter-institutional promotions from health care backgrounds, and because there are many people in various health care fields who will be moving into supervisory and managerial positions in the future, it is considered necessary that relevant continuing education programs be made available to such practitioners who have received this initial training in another area. It is therefore recommended that:

Recommendation #3 - Consideration be given to the development of certificate or degree programs in management and administration which can be offered, at convenient times, to presently employed health, or health related managerial workers to supplement their ad hoc learning experiences.

A further critical need in this HMOC is to insure adequate and appropriate clinical experiences, or internships, for students entering the Health Care Manager field. Also, certain educators in this HMOC will not necessarily have health backgrounds. Since several types of health provider organizations have been specified as ultimate employing institutions, it is important that students obtain appropriate practical work and field experience. The several emerging educational programs in this area already have clinical components and other programs are developing commitments from health provider institutions. It is important, however, to insure that no one clinical facility is over used, that students have adequate supervision while serving their internships and that educators keep up to date with needs of employing institutions. It is, therefore, recommended that:

Recommendation #4 - Each educational program have an appropriate clinical component to provide necessary practical experience, and that adequate supervision be insured during this period. Rotating internships should be incorporated as appropriate to best meet the needs of program graduates and employing institutions.

MEDICAL RECORDS ADMINISTRATORS

Lest there be confusion we wish to first point out that in discussing this field we are utilizing not the trational title of "medical records librarian", but rather medical records administrator in recognition of the changing parameters of duties assigned such personnel. In addition to the responsibility they bear for the patients' histories filed in a hospital or other health care institution, it is increasingly recommended that they should be familiar with the fundamentals of data processing systems, and cognizant of the critical relationship of their work to insurance and legal problems associated with hospital patient management and all phases of medical record practice.

The data from the HMDP (Appendix E, pp. 214-218; also Section 4, Tables 10 and 12, pp. 72 and 85 respectively) were plotted on the following graph, and a reasonable demand line drawn, on a statewide planning scale, since the number of personnel involved is quite small and since there are no training facilities for this HMOC in the State. These projections define supply and demand curves which are divergent. However, the usual critical nature of a divergent situation is mitigated by the small number of personnel, even after taking account of the 65 percent "in-state survival" factor to establish required graduate output (see inset table on Graph #1).

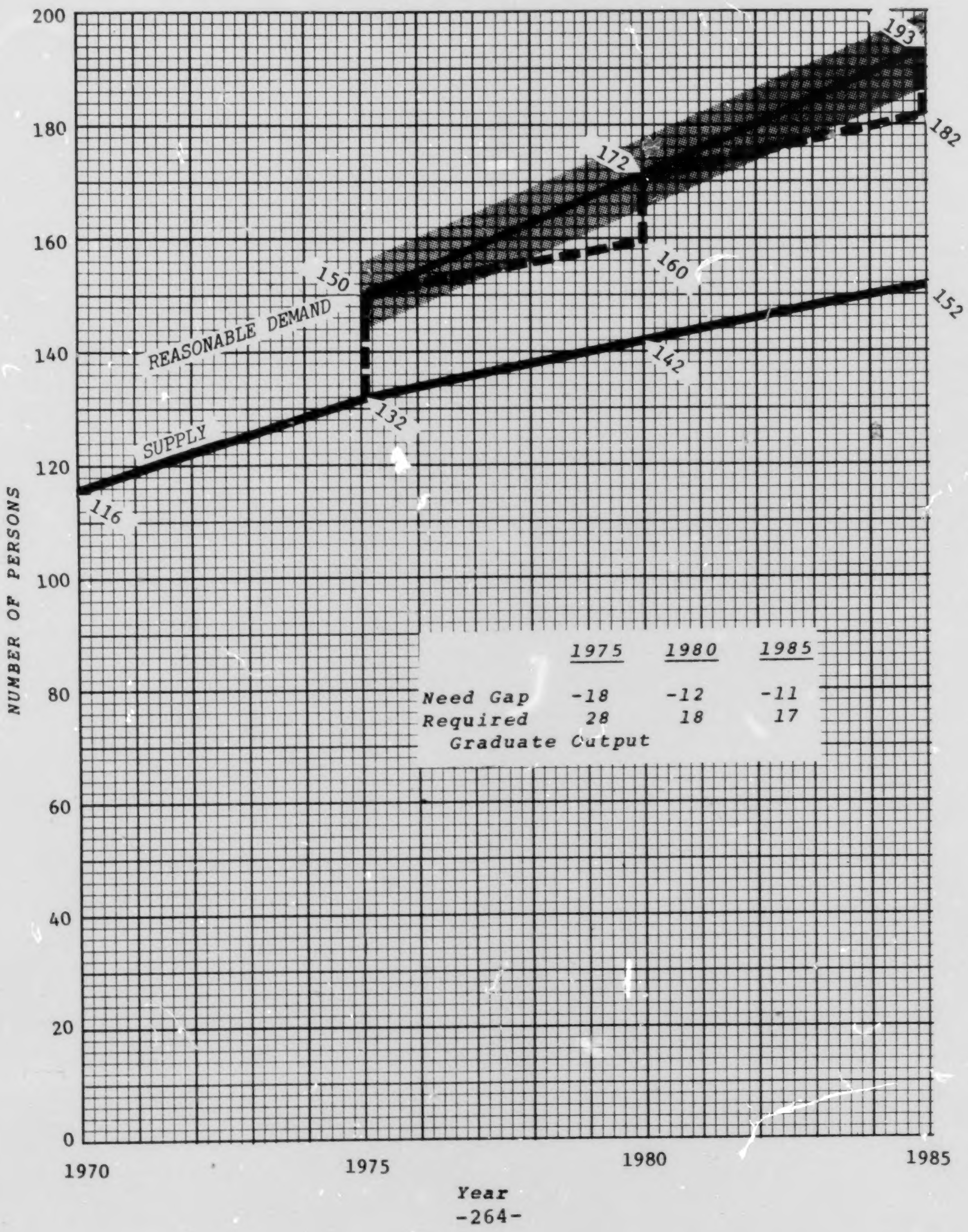
Although there are programs in Philadelphia and New York, in our estimation there is a need for a single program in the State. We, therefore, recommend that:

Recommendation #1 - The Department and Board of Higher Education should be receptive to the inauguration of a single baccalaureate level program for medicalrecords administrators. It should be affiliated with a modern hospital's medical records department, under the leadership of a registered records administrator (librarian), which would provide practical exposure for student demonstration, observation, and directed experience purposes. The development of proficiency examinations should also be encouraged to permit mobility within the profession

GRAPH #1

HMOC: Medical Records Administrators

STATEWIDE BASIS



	1975	1980	1985
Need Gap	-18	-12	-11
Required Graduate Output	28	18	17

MEDICAL RECORDS TECHNICIANS

The traditional definition of the duties of medical records technicians relate them to the size of the establishment in which they are employed. In small hospitals, the technician may be responsible for all aspects of preparing, analyzing and storing patient information, as well as assisting the business or admitting offices. In larger hospitals, they may concentrate on a specific phase of the process, and ultimately become a specialist in one or two areas.

On the other hand, there are those who believe with Dr. William F. Minogue that these duties have been very narrowly defined. "Too much emphasis," according to Dr. Minogue, "has been placed on the horizontal (hospital) patient, and preventive medicine and out-patient services given far too little play. Such categories as data collection (history taking via questionnaire or computer); data processing; medical audit and medical records personnel, have all been left out. The practicing physician needs his operation streamlined and refined through help in this area of information collection, storage and retrieval..."(1)

It appears to us that Dr. Minogue has identified a real issue, although we find that some of the functions he lists are appropriate to a graduate of a four year medical records administration program. On the other hand, a graduate of a two year program in this occupational cluster might very adequately and appropriately fulfill some of the needs Dr. Minogue lists.

Moreover, we find implications in such remarks that much of the work performed at present by medical secretaries and medical (office) assistants, two HMOCs not being considered at this time, might be better performed by persons prepared with the kind of skills possessed by medical records technicians. We are further led to the conclusion that considerable overlapping prevails in the three categories and that we may here be confronted by an illustration of excessively refined occupational specializations and job titles.

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(1) Dr. Minogue is Director of Medical Education at Overlook Hospital in Summit, New Jersey. His remarks were sent to the Department in response to our request for commentary on priority HMOCs to be considered in the master plan.

We are given additional cause for pause when considering the results of the HMDP study for medical records technicians (Appendix E, pp. 214-218; also Section 4, Tables 10 and 12, pp. 72 and 85 respectively). These results are projected visually on Graph #1 on the following page. It will be noted that the supply and reasonable demand curves for this HMOC project an interesting situation. The statewide projection, chosen because of the small labor pool, indicates an oversupply in 1975 of three units. In the future, projections indicate that this oversupply will increase to 11 and 18 units in 1980 and 1985 respectively. For obvious reasons, no projected strategy line has been constructed, since no manpower shortages are indicated. This kind of oversupply may be partly due to the relative ease of recruitment considering the short training period.

In fact, three methods have been identified for persons to become medical records technicians:(2)

1. Through a correspondence course offered by the American Association of Medical Record Librarians.

2. Through completion of a one-year course at a hospital or college.

3. Through completion of a two-year approved AAS degree program at a two year college.

Other explanations which have been given to interpret the low demand for medical records technicians include: the fact that it is not a well-publicized health profession; "higher" and "lower" persons on the occupational scale may actually perform work for which they are trained; the importance of the volume and type of work in which they engage is perhaps not particularly well recognized by potential employers to lead them to hire a person specially trained in this area.

It also should be noted that a single two year program is presently offered in New Jersey at Essex County College. A few years ago, a two year program was approved for presentation by another of the New Jersey community colleges, but was never implemented due evidently to lack of student demand.

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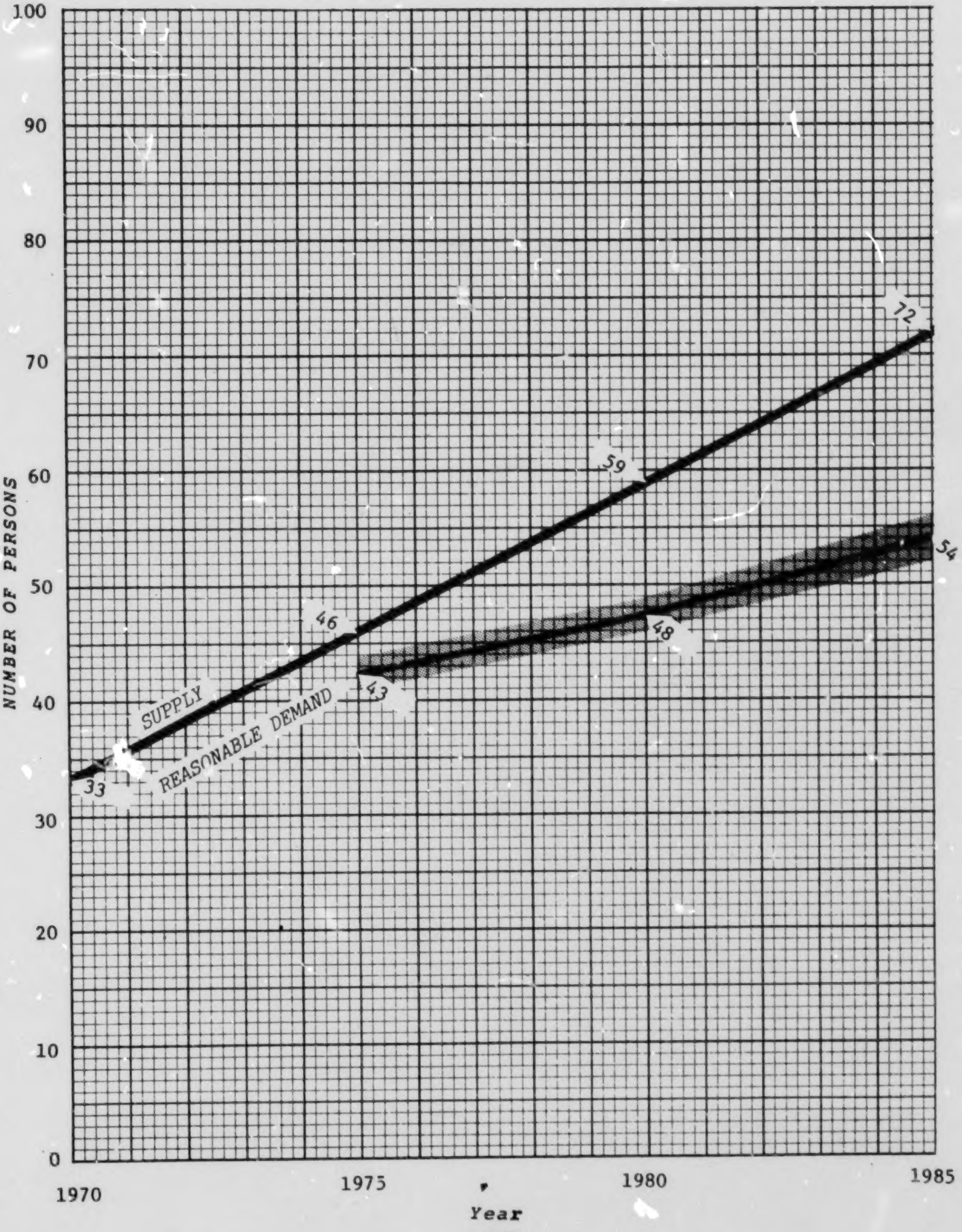
(2) Health Technicians, ed. Robert E. Kinsinger, J. R. Ferguson Publishing Co. 1970, pp. 204-209.

GRAPH #1

HMOC:Medical Records Technicians STATEWIDE BASIS



For all of these reasons, we make the following recommendation:

Recommendation #1 - The HPEAC should supervise a study of the medical records technician, medical secretary and medical (office) assistant HMOCs to ascertain the feasibility of creating a single broad career occupational curriculum, incorporating specialty options where indicated. Pending the completion of this study, no further program approvals should be considered by the Department and Board of Higher Education in any of these three fields.

HEALTH EDUCATORS AND INFORMATION SPECIALISTS

Background and Philosophy

The Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association describes health education as "... the process of providing learning experiences which favorably influence understanding, attitudes, and conduct in regard to individual and community health."

Health Education is multidisciplinary in nature. Its content is largely derived from medicine, public health, and the physical, biological and social sciences. Its methodology is derived largely from the behavioral sciences, primarily psychology, sociology and cultural anthropology.

The School Health Education Study(1) published in 1964 indicated the increasing need for health education in our society and provided current research based on a national sample which provided impetus for school and community health programs across the country.

In September of 1971, President Nixon created the Presidents' Committee on Health Education to recommend ways to develop in the general public a sense of "health consumer citizenship." This is a four-phase program involving fact finding, analysis and evaluation, recommendations and implementation. It is specifically concerned with such major types of health education programs as may be involved in 1) specific action, i.e. immunization 2) habit or attitude changing, i.e. towards drugs, smoking, diet, seat belts 3) community action, i.e., pollution, fluoridation, noise 4) preventive education and 5) community health planning and development of health facilities and services.

The Need

The following brief excerpt also helps set the framework for our selection of this HMOC as one of the priority fieids for consideration in this master plan:

> "Doctors: 'A Sporadic Source of Health Information'
> Only a bare majority of Americans feel their personal physician is the primary source for what they need to know about medicine and health. ---

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(1) School Health Education Study, Sliepcevich, Elena M., Director, Samuel Bronfman Foundation of New York City, Sponsor, Washington, D.C., 1964.

> "While doctors did top the list as sources of health information, the next most common source listed was TV advertising (29%), followed by newspaper medical columns (28%), medicine sections in magazines (26%), and TV medical news programs (25%). Nevertheless, the people who were surveyed stated they felt that doctors, hospitals, and clinics were the most trustworthy sources of reliable information on health and medical care.
>
> "The survey also reveals that Americans generally think they know more about health care than they actually do. For example, 65% of the respondents claimed they could recognize symptoms of important illnesses, but 30% could not identify any one of the 'seven danger signs of cancer', and half were unable to remember more than one symptom of heart attack or a heart condition." (2)

In a letter to the editor which appeared in the October 29, 1971 New York Times, Professor Anne R. Somers of the Rutgers Medical School's Department of Community Medicine further identified the need for this category of health personnel:

> "... the primary causes of America's major health problems -- automobile accidents, obesity, drug and alcohol abuse, venereal disease, many cancers, much heart and circulatory disease, much mental illness -- and of the remaining infant mortality, are the living conditions, lifestyle or ignorance of the consumer himself.
>
> "As one particularly dramatic example, the major risks of death to white males, 20-24, are, in order, motor vehicle accidents, suicide and homicide; for black males of the same age -- homicide, motor vehicle accidents, drowning accidents.
>
> "No amount of new expenditures for health care or even rationalization of the delivery system will come to grips with this problem. What is desperately needed -- along with reforms in the delivery and financing systems -- is a massive program of consumer health education."

Professor Somers' concerns are further underlined in a communication to the Department of Higher Education received from the present Chairman of that same Community Medicine Department, Dr. Richard J. Cross:

> "... health education is a crucial area. The major health problems in America today are not medical in the usual sense of the word; they relate to our life style... A one percent improvement in life style could do more for the health of New Jersey's citizens than all the physicians this medical school will graduate in generations to come...

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(2) "Doctor's Business", Medical World News, February 4, 1972. p. 57.

> it seems clear, however, that this field has been too long neglected by medicine and medical educators and that something needs to be done in the near future."

This study is in full accord with the above sentiments and the implied emphases Professors Somers and Cross place on the need for greater attention being given to the preventive aspects of optimum health. Before identifying an appropriate role for New Jersey's institutions of higher education, it is necessary to expand the traditional concepts of health education into a broad context in which many areas, not heretofore thought of as health education, can be included.

The overall objective of any program of health education is to modify behavior in relation to health (emotional, physical, and social) in a manner that is constructive and beneficial to both the individual and society.

Achieving such behavioral modifications in a complex, multicultural population is an enormous task that will tax both our knowledge and ingenuity. If we are to accomplish this objective, it is therefore essential that comprehensiveness and continuity of programs and services be designed to meet the needs of all segments of our population.

Functional and Educational Preparation

Although the field of health education is organized, specific positions and educational requirements have been established only in some areas, while there are emerging areas of concentration that need further delineation.

As previously indicated, health education is multi-disciplinary in nature. With low priority given to health education, it is only natural that resultant college health education programs, where they exist, are fragmented and often incomplete.

Some of the major obstacles inhibiting the development of health education include:

1. A lack of conviction of the value of health education.
2. A lack of civic and financial support of programs.
3. Administrative structures that are not conducive to facilitating coordination of both service and educational components of a program.
4. Inadequate numbers of qualified personnel who have the background education, practicing experience and adequate educational or teaching expertise.

Additionally, some of the differences between health education and other areas of formal education must be recognized. These have been expressed, in part, by Dr. Marjorie A. C. Young in a paper submitted in February, 1969, to the American College Health Association.

SOME DIFFERENCES BETWEEN HEALTH EDUCATION AND OTHER AREAS OF FORMAL EDUCATION

1. The main objectives of health education are different in that behavior change and maintenance is primary, and the acquisition of factual knowledge secondary.

2. Because our objectives are usually different, our techniques and methods of evaluation must be different. For example, health status and actions are dependent on a large number of factors and variables outside the school environment, many of which we cannot control or measure. These always complicate our evaluation efforts.

3. Perhaps in no other curriculum area are there so many varied and inconsistent sources of influence and information and so many fallacies, misconceptions, and superstititions. This lack of "factual" uniformity and consistency, even among members of the health professions themselves, makes it difficult to educate for health effectively and efficiently.

4. In the field of health, "facts" become rapidly obsolete as research expands knowledge in all areas. This means that we are faced with the constant need for programs for re-education, and re-education poses more complex problems for us than education, especially in the field of health.

5. Health is such a diffuse, generalized concept that it is difficult to educate for it as such. We must constantly reduce it to meaninful specifics, preferably of the kind for which we can demonstrate some definite cause-effect relationship. These are not readily demonstrable in most health education areas where many years of stimulus application may be required to produce patent effects (e.g., cigarette smoking and lung cancer, or effects of psychological climate on mental health).

In spite of the constraints enumerated above, however, certain areas of concentration have emerged which may help to begin delineating this broad field:

I. School Health

The School Health Education Study has made the following recommendations that are included to serve as a guide for action:(3)

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(3) *Op. cit.*

1. "Local school systems or individual states should plan and carry out self-evaluation studies of their health instruction programs to determine existing strengths and weaknesses."

2. "Critical appraisal of all aspects of health instruction is urged. Some facets of the program that should be examined are:

   (a) professional preparation in health education and teaching effectiveness of staff assigned to health instruction

   (b) nature and extent of responsibilities other than classroom teaching that are expected of those designed as health instructors

   (c) in-service opportunities available to teachers for strengthening and expanding their professional competencies in health education

   (d) scheduling practices and time allotment for health instruction

   (e) organizational patterns and administrative factors affecting the health instructional program

   (f) factors in the teaching-learning environment related to instruction and student health practices.

   (g) repetition of learning experiences and omission of health content areas

   (h) policies related to the teaching of subject matter considered to be controversial

   (i) placement and sequential development of health concepts by grade levels

   (j) methodology and teaching approaches

   (k) scientific accuracy and grade level appropriateness of instructional materials

   (l) interpretation to the school staff, parents, and community of the need for health education, its objectives, and its unique characteristics

   (m) parent education programs in health education to assure reinforcement of what is learned in schools

   (n) evaluation procedures."

3. "Better articulation of school health services with the health instruction program is needed. Communication between medical and educational personnel of the total school health program should be continually re-examined."

4. "Faculty members and administrative staff in teacher preparation programs should review the findings of this Study for implications relating to the preparation of all teachers who will be expected to assume any responsibility for health instruction in schools."

5. "A person with specialized professional preparation in health education and who possesses other desirable attributes should be designated to assume responsibility in each school system for the overall coordination of the health instruction program and to provide supervisory assistance."

6. "Needs for research, experimentation, and evaluation expressed throughout this Study should be considered by school systems, graduate departments of colleges and universities, public agencies, private organizations, foundations, and others who are interested in research activities. Efforts should be made to become acquainted with existing sources of support for research in school health education and to stimulate interest in the provision of assistance from yet untapped resources."

A discussion of school health programs is incomplete without specific recognition of two primary types of health professionals, namely the health education teacher who should be a teaching professional with a major in health, and the school nurse-teacher who should be a registered professional nurse with a bachelor's degree preparation for teacher certification, and a major concentration in health education. Thus, their preparation and status, in the school setting, should be at a level commensurate with other teachers. Present preparation and certification requirements governing such personnel warrant re-examination.

The necessity for bi-lingual competence among health educators should also be explored. Moreover, the use of health aides should be encouraged so that health teaching can be conducted on a continuing and comprehensive basis, both within and outside the classroom environment.

II. Community Health

In order to conduct a successful community health program, health workers must consider the significance of the terms health, a product, and the community, a recipient, which means both health problems must be understood and dealt with, as well as the social or public phase of the situation.

Community health cannot be addressed without concern for social process and social change, since they affect health action. Sociomedical problems such as drug dependency, venereal disease, suicide, etc. have their etiology in the family, the neighborhood, the community and the total society. Thus, the treatment and prevention of such problems can come about only through knowledge, understanding and control of these social forces.(4)

The need for health educators in private, voluntary and official agencies, community hospitals and other health facilities, is becoming increasingly apparent. The State of California has, in fact, passed legislation requiring that every local health department must employ a health educator. In New Jersey, however, recognition of the importance and dimension of this activity requires further development. Job opportunities are still lagging. It is hoped and anticipated that the activities of the study group recommended below will also serve as a stimulus to the creation of greater emphasis and employment opportunities in the field. Use of the professional societies such as the American Public Health Association and the Society for Public Health Educators might usefully be encouraged.

While the need for health education is emphasized, the specific identification of individual and community group health needs cannot be determined solely by professional health educators. Consumer input to the determination of goals, policies and programs must be facilitated.

In addition to personnel formally prepared at the collegiate level, it is recognized that a range of aides such as Health Aide Trainees fostered by the Department of Health are needed to obtain data concerning needs and to assist in implementing programs to meet these needs, under the direction of community health educators. It is especially important to build new bridges to the community in this area by utilizing, more effectively than in the past, the health care delivery systems and providers as active vehicles for health education dissemination in addition to bridging the gap between school and community health educators.

III. Health Information

Applying the sophistication of the communications media to the fields of health and education offers the promise of more people securing more accurate information about health and health problems. For example, the development of cable TV will make possible the delivery of highly localized information to target neighborhoods. Ensuring that other forms of mass media carry appropriate and related health information is yet another task of this area of sub-specialization. The basic preparation in this field includes competence in journalism and broadcast media techniques, as well as knowledge of the health field. A baccalaureate program should train these specialists, but other preparational programs are needed to produce auxiliary personnel that would support and implement the work of the specialist.

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(4) Smolensky, Jack and Haar, Franklin, B., Principles of Community Health, W. B. Saunders, Co., Phila, 1967, pp. 36-38.

Manpower Requirements

Department of Higher Education data indicates that in 1968-69 (the latest year for which complete statistics are available) the total number of bachelor's degrees granted in Health Education (or Health Sciences) in the United States was 468. New Jersey granted 128 or 27% of these degrees, while Jersey City State College alone granted 111 or 23% of the national total. This might be misleading, in that a significant aspect of these programs is the preparation of registered nurses to become certified school nurses, although other options also are offered in school health and community health education.*

Therefore, because of the extremely varied backgrounds of current practitioners, data deficiencies in part related to the diversity of the background of many health educators (with many positions not having established educational requirements), and the still open-ended nature of their future responsibilities and scope of activity, no attempt is being made at this stage to project future manpower requirements. Indeed, such projections are made more complex (in view of the many indications from knowledgeable professionals that the field is still greatly neglected) when it is realized that in at least one of the sub-specialty areas, New Jersey is far ahead of the nation in producing such personnel. It is our recommendation that:

Recommendation #1 - The HPEAC should organize a study group immediately for the identification and development of: evolving needs of health education; of new programs; of numbers and types of personnel required to meet these needs; of educational programs at various collegiate levels needed to create appropriate personnel, including where indicated internship experiences; and of effective evaluation of these programs.

Resource people in this group should be drawn from qualified practitioners actively engaged in health education, consumer and community groups, the Departments of Health and Education and the school system, voluntary health agencies, hospital and health professional organizations, New Jersey's collegiate institutions, and the communications media. The human resources from ongoing programs such as health officers and existing adult education resource centers should be fully tapped in designing and recommending the implementation of the additional efforts seen as required in this field. In keeping with the proposals and discussion contained in Chapter V on "Continuing Education", it is also recommended that:

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* The statistical indication of major faculty resources in health education at Jersey City State College may be misleading because of their liberal policy with regard to granting credit in the health sciences for work done in the hospital nursing schools.

- *Recommendation #2 - Appropriate agencies and institutions should develop a joint program which would offer comment background and practical training experiences, with appropriate formal certification, in the field of health information services, to individuals interning in communications media and extension service programs, in order to maximize public understanding of health problems.*

DIETITIANS

Dietitians are specialists responsible for the nutritional care of individuals and groups of individuals. As such, they function in teaching groups of people, in extending knowledge of the principles of nutrition, in the teaching of these principles either formally in classroom situations or informally in individual/group dietary counseling.

In addition to the general practitioner, dietitians are subspecialized by areas of function:

A. Therapeutic dietitian: a person who applies the general principles of dietetics to patient care.

B. Administrator of Dietetic Services: a person who organizes and manages a complex food service operation.

C. Nutrition Educator: a person proficient in teaching and counseling in the community; in colleges, universities, schools of nursing, etc.

Basic education for the profession is achieved through a bachelors degree in dietetics or in home economics, with a sequence or specialization in dietetics. Following completion of a dietetic internship, approved by the American Dietetic Association (the most common avenue for becoming a dietitian), or a two-year, pre-planned work experience, the examination may be taken to be a registered dietitian (RD). At the present time in New Jersey, three colleges offer a baccalaureate in home economics with a dietetics specialization: Douglass College, of Rutgers University; College of St. Elizabeth; and Montclair State College. Douglass College likewise offers a masters level program in nutrition and dietetics.

Continuing education is now mandatory for all registered dietitians. Continuing registration is dependent upon each R.D. obtaining 75 clock hours within a five year period. Responsibility for providing many of the continuing education programs has been assumed by the New Jersey Dietetic Association.

The occupational category of dietitians was projected with one set of figures by the Department of Health's HMDP, (Appendix E, pp. 219-223; also Section 4, Tables 10 and 12, pp. 72 and 85 respectively). The planning unit chosen for this projection was the State. Although proposed and approved programs exist in three of the regions, the small numbers of students involved appeared to mitigate the need for projections on a regional scale. In addition, the mobility of dietitians, compared with less extensively trained personnel, would weaken the significance of regional boundaries.

The graph on the following page indicates the supply and demand curves for this HMOC are nearly parallel. A proposed strategy line to close the supply and demand gap is shown on the graph. The inset table on the graph shows the required graduate output also needed to overcome the "in-state survival" factor of 65 percent in this HMOC, as described in the introductory section of this chapter.

Additional data, compiled by Miriam Brush, Ph. D., Professor, Home Economics Department, Douglass College, concerns the qualifications of "dietitians employed in hospitals in January, 1972." The 80 non-specialized hospitals of over 100 beds indicated that they employed a total of 294 "dietitians" of which 43.5% were ADA members; 30.7% held baccalaureate degrees but were not ADA members; and 25.8% did not have a baccalaureate degree. Sixteen of the hospitals surveyed (25%) had no ADA dietitians at all.(1) Of the total ADA membership in New Jersey, 69% were employed as dietitians but less than half, 205 out of a total of 545, were employed in hospitals.(2)

Given the activity and size of the New Jersey Dietetic Association and the number of hospitals which employ a person in the dietetics field, there appears little need for the establishment of new programs at this time. Existing programs at the baccalaureate level should be expanded to provide the necessary collegiate trained personnel required. In addition, more opportunities should be provided for internships or preplanned experience programs to allow for appropriate credentialing. At present, only one internship program is available in the State with classes limited to approximately 6 interns. It therefore is recommended that:

Recommendation #1 - In the dietetics field the existent programs should seek ways to increase their enrollments in keeping with the manpower needs identified herein. The Department and Board of Higher Education should consider approval of new programs only where regional lacks warrant, and in keeping with the principles of regionalization, health professions education consortia, and program clustering identified in Chapter VI.

Recommendation #2 - Internship programs or post baccalaureate experiences to qualify dietitians to become registered should be made available within the manpower projections outlined in this section.

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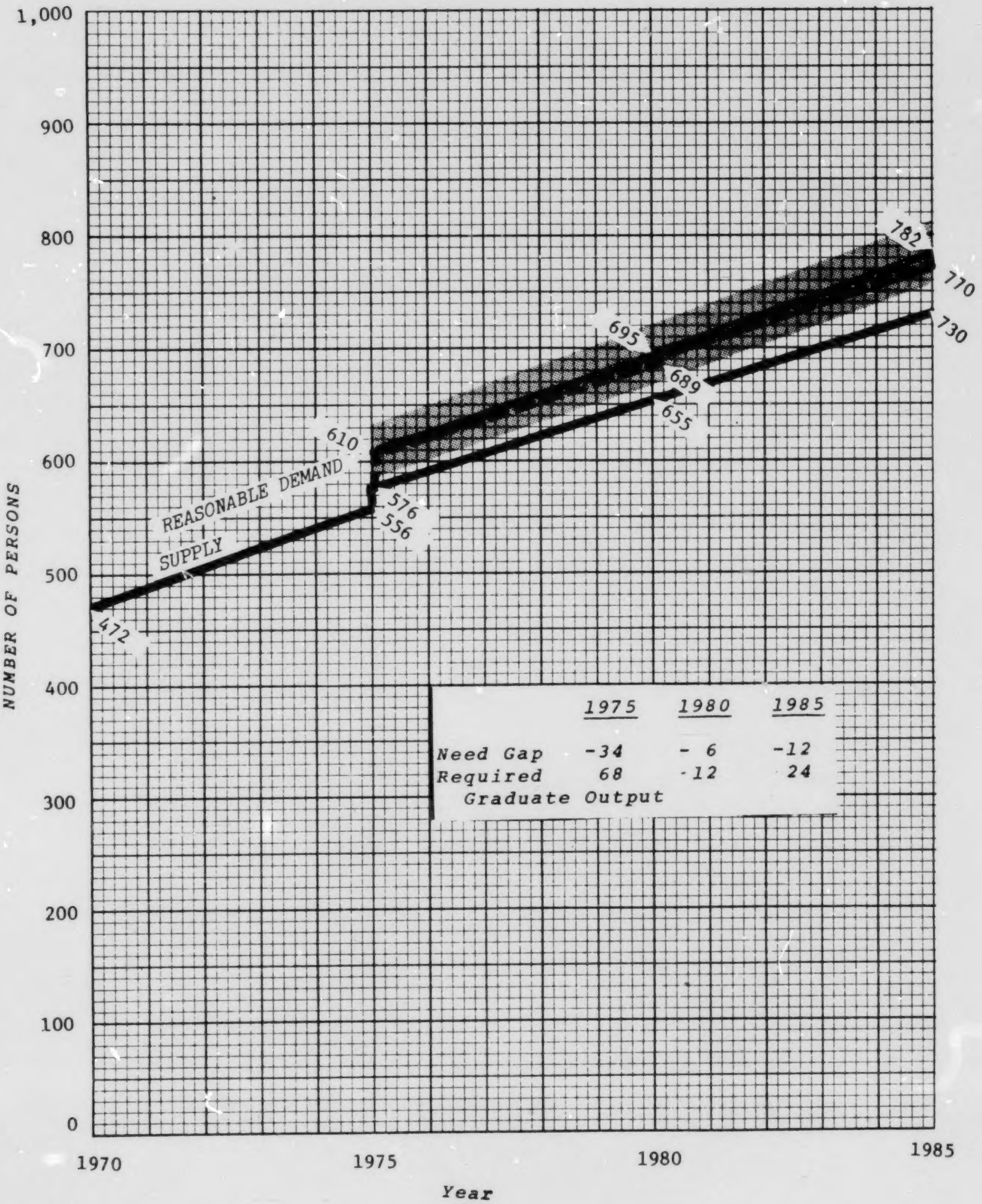
(1) Letter to Edward Cohen from Miriam Brush, May 15, 1972 with enclosed extract of survey.

(2) ADA data, Nov. 1970.

GRAPH #1

HMOC: Dietitians

STATEWIDE BASIS



	1975	1980	1985
Need Gap	-34	- 6	-12
Required Graduate Output	68	12	24

CHAPTER XI

IMPLEMENTATION OF THE MASTER PLAN

We have attempted in the preparation of the material in the preceding chapters to avoid the tyranny of corporate design associated with certain types of "five-year plans." Those, moreover, who had searched for a simple rank ordering of step-by-step actions to be taken, much less mandated by the Department of Higher Education, will be disappointed. Our basic intent, instead, has been to develop a framework or matrix within which an inter-related and complex series of decisions can be made by higher education institutions seeking to offer health professions education programs, and agencies and boards charged with approving such activities.

In the elaboration of the material presented, we have sought and incorporated the reactions and counsel of the Advisory Committee appointed to the health professions aspect of Phase III of the Higher Education Master Plan (see Appendix A for membership).

In addition, a series of conferences and workshops (Appendix B presents a complete listing) were conducted to provide additional commentary on the ideas, information and almost 100 specific recommendations contained in both the preliminary and revised drafts of this document. The Foreword acknowledges much of the assistance we have received; we anticipate further critiques and re-working of the material in the years ahead to insure that this "rolling master plan" will represent a cooperative and implementable instrument to guide State efforts in health professions education programming in the future.

Implementation Procedures

The achievement of the goals and objectives of any plan is dependent on the strategy employed for their implementation. Throughout the previous chapters allusions have been made to the formation of several mechanisms which would be necessary to carry out the various recommendations. We believe that these mechanisms deserve as much scrutiny as the recommendations themselves.

Fundamentally, the responsibility for the implementation of this plan rests with the collegiate institutions, provider (employer) agencies, and professions involved. Nonacceptance on their part of responsibility for the development of a coordinated educational program for the health professions would cause it to fail. Perhaps the major focus for implementation of this plan lies at the level of the health professions program directors and deans, and relies on their willingness to work both regionally and statewide for its fulfillment.

In addition, the Chapter VI sections on regionalization and health professions education consortia discussed the channels of communication and coordination between the HPEAC and the manpower committees of the Comprehensive Health Planning "B" Agencies for program planning purposes. These groups will work with the HPEAC to clarify manpower needs and the appropriateness of the proposed clinical facilities. These manpower subcommittees will provide another mechanism for bringing educators together with health providers, professionals and consumers in the planning process. By so involving such committees, representative of a diversity of interests, we believe the problems of regionalization, program articulation and utilization of clinical facilities will be most usefully addressed at their critical nexus.

To coordinate both the efforts of these regional and statewide peer groups of educational program directors and deans, as well as those of the "B" Agency manpower committees, we are counting upon the integrating force of the Health Professions Education Advisory Council (HPEAC). This newly formed Council is believed to be one of the Department's most widely representative advisory bodies. Its recommendations will not only apply to all health professions education policies, but will include advice and counsel on the approval of new programs, and the design and promotion of health professions education consortia. With this group providing a focus for the activities of HMOC program directors and other leaders at the collegiate level, the implementation of the master plan can proceed with both broad support and wide participation. Moreover, the HPEAC and the Department will be reponsible for insuring that task forces and study groups include appropriate representatives, and that the views of concerned professional societies, licensure and accrediting agencies, and consumer and community agencies, are duly considered in their deliberations and actions, as is explicitly called for in many of the recommendations.

The following pages more fully outline the purposes and composition of the HPEAC.

A. The Purposes and Composition of the HPEAC

At its February 1972 meeting the Board of Higher Education approved the establishment of the Health Professions Education Advisory Council "to advise the Chancellor and the Board of Higher Education on planning, curriculum coordination, and program evaluation in this field." (See Appendix C for the full text of the proposal adopted by the Board; Appendix D lists the present members and alternates on the HPEAC.)

The charge goes on to state that: "The Council will recommend general policies to the Board of Higher Education, advise the Board on new programs, evaluate and assist in the maintenance of qualitative instructional standards, and assist in gaining adherence to on-going master planning in health professions education". (emphasis added)

The HPEAC's ability to assist future efforts related to the ongoing development of this "rolling master plan", is strongly reinforced through the representation on the Council of a spectrum of cooperating institutions, health planning agencies, community organization, consumer representatives and practitioners.(1) This array includes representatives from the following:

a. College of Medicine & Dentistry of New Jersey
b. Rutgers University
c. State Colleges
d. Community Colleges
e. Independent Colleges & Universities
f. Dept.of Health,Div. of Comprehensive Health Planning
g. New Jersey Hospital Association
h. New Jersey Regional Medical Program
i. Community organization representatives
j. Consumer representatives
k. Dept.of Education, Div. of Vocational Education
l. Medical, dental and nursing associations

We are aware that the input of students is important. We feel, however, that no one student or student group could appropriately represent all student interests in New Jersey. We also feel that it is the responsibility of each institution to be responsive to student needs. Accordingly, the HPEAC is incorporating student review in the program approval process.

B. The HPEAC as a Statewide Coordinator

At the present time the HPEAC has established a learning resources subcommittee whose responsibilities include the preparation of guidelines for the evaluation of the educational utilization of clinical facilities as they relate to program approvals. The Council's review of program proposals in the future would then include a thorough review of the clinical component of each program and its affiliates.

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(1) An important consequence of the various meetings held to review the earlier drafts of this plan, is the addition of further consumer and community organization representatives as well as practitioner designees of the medical, dental and nursing associations on the HPEAC. The original formulation was deficient in these respects, but this situation has now been corrected and is reflected in Appendix D.

Two recommendations have been made in this master plan(2), which propose the creation of a second subcommittee which, among other matters, would specifically explore the potentials for development of core curricula, modular instructional units, and training ladders in the health professions education programs of this State. This proposed "Curriculum Subcommittee" would provide the Council with specific in-depth analyses and recommendations for possible adoption by the health professions programs in the State. Resource persons would be drawn from the collegiate institutions, professional organizations, employer groups, governmental agencies, etc., as needed by both of these major sub-committees.

A third HPEAC subcommittee would appear indicated to coordinate efforts arising from the various problems, study groups, demonstration projects, etc. called for in Chapter III on Accreditation, Licensure and Certification. A particular responsibility of this subcommittee will be to assist in efforts regarding the authority of new occupations to practice as members of the health care team.

In addition to these three large sub-committees, it is further suggested that the HPEAC consider forming where necessary other sub-committees, each of which would have responsibility for:

1. Developing expertise and familiarization with a given professional cluster, and
2. Stimulating and coordinating the planning activities of the program directors or deans within their program cluster in order to encourage appropriate investigation of such matters as modular instructional units, institutional sharing of facilities, etc.

Throughout the plan it has been suggested that where curriculum discussions impinge on current licensure procedures, or the scope of professional practice in an occupational category, that representatives of the State's licensing boards, as well as professional society representatives, be brought into these sub-committee deliberations so that their input can be utilized in program design efforts.

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(2) Recommendations #11 and #12 in Chapter IV on Recruitment, Retention and Mobility.

C. Proposed Grouping of Program Directors and Deans

Any serious attempt to implement the recommendations of this master plan must be done through some formal organization of the directors and deans of related health professions programs. It is proposed that the implementation process of the master plan draw heavily upon productive workshops organized by the academic leaders of such related programs. This same approach should be followed in the continual updating of the master plan in future years. Finally, the ongoing organization and activity of these program directors should be viewed as part of their long-term commitment to state coordination in their curricular areas of responsibility.

CONCLUSION

There is no aspect of service and education in the health professions which is not presently in a state of flux. Our projections and recommendations may become outmoded more rapidly than even the most pessimistic among us would expect.

We also ask ourselves whether it is even realistic to project a plan that attempts to increase, improve and rationalize so many facets of our health professions education programs. Certainly we should not pollyanishly anticipate a limitless fund of resources.

Nevertheless, such a plan as this is a worthwhile and necessary enterprise. If the objectives, methodologies, assumptions and projections are subjected to a continuing and critical review, and we are prepared to change them when indicated, such a plan can acquire new dimensions and meet new challenges as they become apparent.

If the goals are viewed broadly, and the projections of manpower needs treated reasonably flexibly, such a plan can retain its validity for at least the next decade. With the constructive assistance of the community of health professions educators, practitioners, employers, and consumers it is anticipated that this plan will mature in quality, broaden in scope, and serve the purposes for which it is so urgently demanded.

CHAPTER XII

EVALUATION AND REVIEW OF THE HEALTH PROFESSIONS EDUCATION MASTER PLAN

A Dynamic Master Plan

Throughout this document it has been stated that the planning process adopted by the Department of Higher Education for the health professions will be a "rolling" one. Such a process would include ongoing revision and development of the Master Plan document itself, to meet the changing needs of health professions education. This concept has been adopted on philosophical, as well as on practical grounds. The mechanism for this evaluation of the HPEMP is detailed below.

An Advisory Committee for Master Plan Evaluation

As suggested at many area-wide HPEMP review conferences, it would be advisable to keep the evaluation of the HPEMP document separate from the plan implementation responsibilities of the HPEAC discussed in Chapter XI. We concur with these sentiments and therefore recommend that:

Recommendation #1 - The HPEMP Advisory Committee should remain in existence and be reconstituted in order to continue the process of assisting the Department in the evaluation of the Master Plan, and updating, expanding, and/or revising it as needed.

This Committee will be empowered to set up its own rules and procedures, including meeting schedules. It is suggested, however, that this body meet no less than three times annually. The general guidelines determining the functions of the HPEMP Advisory Committee will be established as set forth below.

Functions of the HPEMP Advisory Committee

1. To conduct a periodic review of policies and recommendations made in the HPEMP, in light of new manpower projections, emerging social and educational needs and trends, technological innovations, developments in modes of health care delivery, and changes in personnel productivity and interrelationships.

2. To assess HPEMP recommendations for studies, projects, programs, etc., in light of new state-wide needs and trends, with a view toward recommending revisions in the Master Plan whenever necessary.

3. To provide a forum for any institution, agency, group or individual involved in health professions education or employment to present views, critiques, and suggestions.

The Advisory Committee also would be responsible for insuring that appropriate consideration is given to suggestions for changes or enlargements of the HPEMP, as derived from such feedback.

These outlined functions are not meant to duplicate the activities of the HPEAC. The HPEMP Advisory Committee, therefore, should not be expected to become involved in the review and approval of individual educational programs, nor should it take direct action in the implementation of the Plan. Its role will be purely one of assessment and advisement in the further development of the planning document itself.

HPEMP Advisory Committee Membership

Committee members will be representative of each of the constituencies listed below. They will be selected by their respective groups and recommended to the Board of Higher Education for appointment to the Committee, for terms of office yet to be established by the Board.

Representation on the HPEMP Advisory Committee should include the following interested sectors:

Colleges and Universities (public/private)
Physician, Dental, Nursing, and other Health Professions Services
Health Agencies (governmental/voluntary)
Professional Societies
Community Health Agencies
Health Consumers
Guidance Personnel
Credentialing Bodies
Students
HPEAC (2 members suggested)
Other State government bodies

While it is recognized that two advisory groups with different purviews are necessary, it is also important that an open flow of dialogue exist between the HPEAC and HPEMP Advisory Committee. This will help insure that both planning and implementation activities within these bodies remain congruent. To implement this concept, two members of the HPEAC would serve on the HPEMP Advisory Committee.

Inputs to the Evaluation - Review Process

Aside from representative HPEMP Advisory Committee and HPEAC membership, inputs from institutions, agencies, groups and individuals will be considered in the process of evaluation and review. The participation of interested groups and individuals will be sought during subcommittee formation. Since the HPEMP Advisory Committee will be composed of representatives of a broad range of interested groups, in many instances it may act as both a provider of and channel for outside contributions. The Department, itself, will undoubtedly continue to receive commentary and will periodically present its ongoing planning results to the Advisory Committee for review and guidance.

APPENDIX A

ADVISORY COMMITTEE

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Vineland, New Jersey 08360

8. Gordan MacInness, Jr., M.P.A.
Executive Dir. & Vice President
Wallace Eljabar Fund, Inc.
50 Evergreen Place
E. Orange, New Jersey 07018

9. Margaret Marshall, R.N., M.S.
Director of Nursing
William Paterson College
Wayne, New Jersey 07470

10. Kenneth McKay, Ph.D.
Executive Director
Union County Higher Education
Coordinating Council
Madison, New Jersey

11. Deckle McLean, D.D.S.
803 Montgomery Street
Jersey City, New Jersey

12. Gene-Anne Polk, M.D.
374 Miller Avenue
Englewood, New Jersey 07631

13. David Pramer, Ph.D.
Director of Biological Sciences
Rutgers College
Rutgers University
New Brunswick, New Jersey 08903

14. Charles Vevier, Ph.D.
Executive Vice President
CMDNJ
100 Bergen Street
Newark, New Jersey 07103

Major Meetings, Conferences, Workshops Held to discuss
Preliminary and Revised Drafts of
HEALTH PROFESSIONS EDUCATION MASTER PLAN (HPEMP)

DATE 1972	DESCRIPTION	LOCATION	NUMBER ATTENDING
25 April	Nursing - NJLN & NJSNA	Ramada Inn E. Brunswick	175
16 May	Nursing - Council of Nursing Education, NJSNA	Holiday Inn Morristown	175
5 June	HPEMP Advisory Comm.	DHE	15
9 June	Health Manpower Committee, State Health Planning	Department of Health, Trenton	15
12 June	Comprehensive Health Council Planning Division	Department of Health, Trenton	8
14 June	Association of Diploma Schools of Professional Nursing	Holiday Inn, Edison	30
17 June	Presentation/Overview of HPEMP	Livingston College Rutgers University	175
23 June	Dental Personnel Conf., Steering Comm.	Dental Assn. Bldg. North Brunswick	15
28 June	HPEMP Advisory Comm.	DHE	10
6 July	Physicians, Physician's Assts Confs., Steering Comm.	RMS-CMDNJ	5
12 July	Nursing - NJLN	Newark	12
12 July	Pharmacy Conf. Steering Comm.	College of Pharmacy, Rutgers	5
17 July	Pharmacy Conf. Steering Comm.	College of Pharmacy, Rutgers	5
21 July	Regional Medical Program	East Orange	6

25 July	Consumer-Student Concerns Steering Comm.	Labor Ed. Center Rutgers	25
25 July	Accrd., Licens. & Certif. Conf., Steering Comm.	College Nursing, Rutgers	5
27 July	HPEMP Advisory Comm.	DHE	15
28 July	Team Conf. Steering Comm.	DHE	20
2 August	Dental Health Personnel Conf.	Mercer CCC	125
4 August	Hosp. Adm. Planning Conf.	DHE	10
14 August	Institutional Responsibilities Conf. Steering Comm.	Ramada Inn Edison	25
7 September	Team Conference Planning Meeting	N. J. Medical Society, Trenton	5
12 September	Professional Nurses, Assn. of Diploma Schools	Christ Hospital Jersey City	40
20 September	Accreditation, Licensure & Certification Conf.	Labor Ed. Center Rutgers	50
23 September	Health Educators & Info Specialists Workshop	RMS, CMDNJ	25
23 September	Institutional Respon. Conf.	Middlesex CCC	100
26 September	Pharmacists Workshop	Labor Ed. Center Rutgers	30
26 September	Council of Baccalaureate Deans of Schools of Nursing	Seton Hall University	6
28 September	Hosp. Administrators Conf.	N.J. Hosp. Assoc. Princeton	50

2 October	Assn. of Chairmen of Assoc. Degree Nursing Programs	Ocean County College	10
5 October	Professional Nurses Workshop	Labor Ed. Center Rutgers	15
6 October	Team Concept Conf.	Labor Ed. Center Rutgers	75
11 October	Health Care Managers Workshop	Livingston College, Rutgers	15
13 October	Health Manpower Comm., State Health Planning Council	Dept. of Health, Trenton	20
19 October	Physicians Conference	RMS- CMDNJ	50
24 October	Research Workshop	NJMS - CMDNJ	15
25 October	HPEMP Advisory Comm.	DHE	15
26 October	Physician's Asst. Conf.	Livingston College Rutgers	50
1 November	Veterinarians, Vet. Med. Ed. Advisory Comm.	DHE	10
2 November	Overview, HPEMP, Health Occupation Instructors Conf., N.J. Ed. Assoc.	Atlantic City	125
7 November	Research Workshop	RMS - CMDNJ	15
8 November	Overview, HPEMP, N.J. Academy of Ophthalmology and Otolaryngology	Newark	150
11 November	Area Conf. Revised Draft Steering Comm.	Ramada Inn New Brunswick	30
14 November	Medical Technologists	DHE	5
15 November	HPEMP Advisory Comm.	DHE	10
16 November	Manpower Projections, Institute for the Conservation of Human Resources	Columbia University N.Y.C.	7

17 November	Inhalation Therapy	DHE	4
20 November	N.J. Society for Nursing Service Administrators	NJHA, Princeton	75
30 November	HPEMP Advisory Comm.	DHE	10
1973			
18 January	Overview, HPEMP, N.J. Section, American College of Dentists	Holiday Inn Kenilworth	100 (est.)
27 January	Area IV Conference	Camden County College, Blackwood	125 (est.)
30 January	Physical Therapists	DHE	10
2 Feb.	CMDNJ Faculty	Newark	60
3 February	Area II Conference	Union County Tech., Scotch Plains	125 (est.)
7 February	Area III Conference	Lab. Ed. Cen. Ruters	125 (est.)
10 February	Area I Conference	Wm. Paterson State College	125 (est.)
13 Feb.	N.J. State Dept. of Health	DHE	5
16 Feb.	CMDNJ, Rutgers Medical School	Piscataway	50
23 Feb.	N.J. State Nurses Assn.	Montclair	5
27 Feb.	N.J. League for Nursing	Newark	500
12 Mar.	Council of Communtiy Colleges and Council of State College	Forsgate Inn Jamesburg	20
14 Mar.	Assoc. of Private Colleges and Univ.	Union College	8
23 May	N.J. Chapter, International Association of Dental Research	FDU	50

HEALTH PROFESSIONS EDUCATION ADVISORY COUNCIL

(Established by the N. J. Board of Higher
Education, February 18, 1972)

A. SUMMARY

A statewide Health Professions Education Advisory Council shall be created to advise the Chancellor and Board of Higher Education on planning, curriculum coordination, and program evaluation in this field. This Council is necessitated by the inter-related nature of the practice and educational preparation of health professionals. The Council will recommend general policies to the Board of Higher Education, advise the Board on new programs, evaluate and assist in the maintenance of qualitative instructional standards, and assist in gaining adherence to on-going master planning in health professions education.

B. GENERAL PURPOSE AND GOALS

1. Since the Council will include representation from all of New Jersey's higher education institutions, it will serve as a vertical and horizontal advisory agency capable of coordinating programs both within a given degree level (e.g. associate and baccalaureate) and between degree levels. A related responsibility will be to insure that career mobility, both upward and lateral, is fostered wherever feasible.

2. The Council will promote, as appropriate, the training of auxiliary medical and dental personnel alongside prime professional personnel. It will contribute to the development of the team approach concept in the delivery of health care and the education of health personnel, wherein health practitioners are encouraged to work together through prior participation in an inter-disciplinary educational process. It thus will foster the creation of educational environments in which efficient and wide-spread use is made of auxiliary personnel, with its consequent effects both on the cost and availability of health services.

3. The Council will take maximum advantage of existing academic and clinical resources, by supporting regionalized and joint or cooperative program offerings by the various higher education institutions. It will help stabilize and avoid the potential sharpness of wasteful competition and expansion.

4. The Council will enable the higher education system in New Jersey to take full advantage of the human and

physical resources of the College of Medicine and Dentistry of New Jersey. The CMDNJ obviously has a pivotal role to play in the elaboration and development of health professions education in the State, particularly with regard to its professional and clinical components. At the same time, aware not only of the continuing role of the basic sciences but also of the growing importance of the social sciences and of communication skills in the education of health professionals, the Council will also ensure the optimal use of the vast and varied resources of other institutions of higher education in New Jersey, both public and private. In this way, in addition to avoiding wasteful duplication between CMDNJ and other institutions, the Council can ensure that medical and dental practitioners and educators work closely together with their colleagues in the other colleges and universitites so as to link the changing occupational roles of health care personnel with the content of their academic curricula.

5. The Council's functions would not preclude the review of health professions education programs by existent organizations such as the Community College Curriculum Coordinating Committee. It would be the latter Committee's prerogative, if it desired, to also review programs and advise the Department and Board separately. Nevertheless, it is anticipated that since the community colleges would be represented on the Council and their interest and views fully considered in that body's deliberations, that these institutions might decide to defer to its recommendations in this field.

6. The Council would give special attention to ensuring the availability and the quantity of clinical components of all health professions education programs. The need for this arises from the fact that the procedures followed by the national professional accrediting organizations (at present relied upon as the major basis for establishing the adequacy of the clinical aspects of allied health programs) are highly variable in quality and depth. The Hospital Research and Educational Trust of New Jersey (HRET) has noted to the Department that while "some groups have a regular review mechanism... others require a written application for approval only at the time a program is established. Unfortunately the emphasis for approval is too often placed upon only the didactic portions of a program, with the extremely important clinical aspects almost completely neglected". The HRET notes additional problems arising from lack of recognition of the true costs associated with offering clinical affiliations, and the consequent weakening of the support sometimes provided by the clinical institution.

Further problems identified by the HRET include the lack of a periodic reappraisal of the clinical support personnel and resources, which can change following initial accreditation; the fact that accreditation teams are often unaware of the full extent of a clinical facility's involvement in educational activity, and it often happens that the patient load of a given facility is insufficient to support the number of affiliations entered into.

For these and related reasons, the Council will establish a sub-committee to specifically address these problems, with consideration given to involving HRET staff in its activities.

7. In anticipation of Board approval of a Health Professions Education Master Plan by the end of Academic Year 1971-1972, the Council would serve as a continuing advisory body for further development of that Plan. At the present time, an Advisory Committee is assisting in the elaboration of the Plan. While the Plan is reasonably extensive and far-reaching, it nonetheless constitutes only a first step towards master planning in this many-faceted and complex field. Continuing updating and expansion will be required, both to address health manpower categories not covered initially, and to maintain currency with the many changes anticipated in health care delivery and education. To provide guidelines for future master planning, the Council would constitute the most intimately knowledgeable and viable agency for that purpose. Adherence to the Master Plan, of course, will likewise be a concern of the Council in all its activities.

C. SPECIFIC RESPONSIBILITIES

1. No program approvals and policy recommendations in the health professions field will be considered by the Board of Higher Education unless accompanied by an advisory opinion from the Council. The Council, however, shall be obligated to expeditiously forward its recommendations, generally within 60 days and in accord with Departmental governing procedures and timetables for program approvals.

2. Proposals to establish new schools, departments, or divisions in the allied health field by any higher education institution also will be reviewed by the Council prior to Board action. The Council's recommendation shall be presented to the Board at that time.

3. The Council may be asked, from time to time, by the

Chancellor or the Board of Higher Education, to review the goals and effectiveness of existing programs in the health professions.

4. The Council will review all applications for discontinuance of existing programs.

5. The Council shall make its recommendations directly to the Chancellor and Board of Higher Education.

6. The Council shall hold its first meeting within one month following its establishment by the Board of Higher Education

D. ORGANIZATION

1. The Council will elect its own officers and establish by-laws to govern its operations. The Chancellor will appoint members of the Council, on the recommendation of member institutions, for one-year terms.

2. The Chancellor will be charged with providing necessary administrative support for the activities of the Council.

3. The Council is empowered to establish reasonable criteria and timetables for submission of materials for its consideration and advisory review, to permit its due processing of program approval request, etc., in conformity with Department and Board of Higher Education procedures in these matters.

4. A summary of the proceedings of each meeting shall be provided by the Council to the Chancellor.

5. The Council shall consist of 16 voting members as follows:

INSTITUTION(S)	APPOINTING AUTHORITY	# OF REPS.
a. CMDNJ	President	3
b. Rutgers, The State U.	President	2
c. State Colleges	Council of State Colleges	2
d. Community Colleges	Council of Community Colleges	2
e. Independent Colls.&Univs.	Assn. of Indep. Colls. & Univs.	2
f. Dept. of Health, Div. of Comp. Health Planning	Commissioner	1
g. N.J. Hospital Assn.	President	1
h. Regional Medical Program	Coordinator	1
i. Dept. of Education, Div. of Vocational Education	Commissioner	1
j. Community representative	Chancellor	1
	TOTAL	16

In addition, the Chancellor shall appoint a Departmental representative for liaison purposes with the Council. The Council, at its discretion, may invite such non-voting specialists as it deems necessary for the proper discharge of its responsibilities.(1)

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(1) Subsequent to the original BHE action, the Chancellor added two consumer representatives, and their alternates, to the membership of the HPEAC. A total of six members and alternates are also being added to HPEAC to represent the State dental, nursing and medical societies.

STATE OF NEW JERSEY

STATE BOARD OF HIGHER EDUCATION

RESOLUTION TO ESTABLISH A HEALTH PROFESSIONS EDUCATION ADVISORY COUNCIL

RESOLUTION

WHEREAS: The Board of Higher Education directed the Chancellor at its November 1971 meeting to develop a proposal for the formation of a Health Professions Education Advisory Council, and

WHEREAS: The attached proposal was prepared and discussed with the representatives of all of the institutions of higher education in the State, and this proposal outlining the objectives, responsibilities, organization and membership of the Health Professions Education Advisory Council would establish an effective advisory mechanism for coordinating policy, program approvals and evaluation in this field, now therefore be it

RESOLVED: That the Board of Higher Education hereby establishes the Health Professions Education Advisory Council in accord with the attached document, and directs the Chancellor to take all necessary actions to effect its immediate formation.

February 18, 1972

APPENDIX D

HEALTH PROFESSIONS EDUCATION

ADVISORY COUNCIL

May 1973 MEMBERSHIP

MEMBER	ALTERNATE
Stanley S. Bergen, Jr., M.D. President - CMDNJ 100 Bergen Street Newark, New Jersey 07103 201-877-4400	Harry D. Borbe, M.A. Exec. Asst. to the President CMDNJ - RMS, P. O. Box 2100 New Brunswick, N.J. 08903 201-932-3440
Donald Louria, M.D. Chairman, Dept. of Community Medicine CMDNJ - New Jersey Medical School 100 Bergen Street Newark, New Jersey 07103 201-877-4422	Mark A. Quinones, Ph.D. Dir., Div. of Social Medicine & Training, CMDNJ - NJMS 100 Bergen Street Newark, New Jersey 07103 201-877-4343
John Eisner, D.D.S. Asst. to the Dean CMDNJ - New Jersey Dental School 201 Cornelison Avenue Jersey City, New Jersey 07304	Gordon Vincent, D.D.S., M.S. Associate Dean CMDNJ - New Jersey Dental School 201 Cornelison Avenue Jersey City, New Jersey 07304 201-877-4633
Rutgers University	
Horace J. DePodwin, Ph.D. Acting Provost Rutgers University 53 Washington Street Newark, New Jersey 07102 201-648-5541	James E. Young, Ph.D. Dean, College of Arts and Sciences Rutgers University Camden, New Jersey 08103 201-964-1766, ext. 315
David Pramer, Ph.D. Director, Biological Sciences Rutgers University New Brunswick, New Jersey 08903 201-247-1766 ext. 6118	Ernest A. Lynton, Ph.D. Dean, College of Arts and Sciences Rutgers University Camden, New Jersey 08103 201-964-1766, ext. 315
State Colleges	
Margaret Marshall, R.N., M.S. Director of Nursing Wm. Paterson College of N.J. Wayne, New Jersey 07470 201-881-2432	Milton Grodsky, Ph.D. Academic Vice President Wm. Paterson College of N.J. Wayne, New Jersey 07470 201-881-2121
June Lithgow, M.S.N. Acting Dir., Division of Nursing Trenton State College Martin House Trenton, New Jersey 08625 609-771-2688	Clayton R. Brower, Ed.D. President Trenton State College Trenton, New Jersey 08625 609-771-2102

Community Colleges

Andrew S. Moreland, Ed.D.
President, Ocean County College
Hooper Avenue
Toms River, New Jersey 08753
201-255-4000

Doris Geyer, R.N., B.S., M.Ed.
Chairman, Nursing Department
Ocean County College
Toms River, New Jersey 08753
201-255-4000

Frank M. Chambers, Ed.D.
President
Middlesex County College
Edison, New Jersey 08817
201-548-6000

Rose Channing, R.N., Dean
Div. of Health Technologies
Middlesex County College
Edison, New Jersey 08817
201-548-6000

Independent Colleges & Universities

Louis J. Boucher, D.D.S.
Dean, School of Dentistry
Fairleigh Dickinson University
110 Fuller Place
Hackensack, New Jersey 07601
201-836-6300

Arthur Van Stewart, D.D.S.
Chairman of Community Dentistry
School of Dentistry
Fairleigh Dickinson University
110 Fuller Place
Hackensack, New Jersey 07601
201-836-6300 ext. 556

Nicholas D. DeProspo, Ph.D.
Professor of Biology &
Acting Dean of the College of
Arts & Sciences
Seton Hall University
South Orange, New Jersey 07079
201-762-9000 ext. 501

Agnes M. Reinkemeyer, S.S.M.,R.N., Ph.D.
Dean of School of Nursing
Seton Hall University
South Orange, New Jersey 07079
201-762-9000 ext. 405 or 406

Department of Health, Division of Comprehensive Health Planning

Joseph C. Kale, Director
Div. of Comprehensive Health
Planning
John Fitch Plaza
Trenton, New Jersey 08625
609-292-5960

Kenneth Paisley, M.S., M.P.H.
Consultant, Div. of Comprehensive
Health Planning
John Fitch Plaza
Trenton, New Jersey 08625
609-292-5960

New Jersey Hospital Association

Jack Owen, M.B.A.
President
New Jersey Hospital Association
1101 State Road/Research Park
Princeton, New Jersey 08540
609-924-4124

Philip W. Morgan, Vice President
Hospital Research & Educational
Trust of New Jersey
1101 State Road/Research Park
Princeton, New Jersey 08540
609-924-4124

Regional Medical Program

Alvin Florin, M.D.
Coordinator
N.J. Regional Medical Program
7 Glenwood Avenue
East Orange, New Jersey 07017
201-674-7270

Marie DelGuercio, M.S.N.
Associate Coordinator
N.J. Regional Medical Program
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East Orange, New Jersey 07017
201-676-7270 ext. 49

Community Representative

Elizabeth M. Boggs, Ph.D.
Vice Chairman
N.J. Developmental Disabilities Council
R.D. #1
Hampton, New Jersey 08827
201-735-8408

William K. Selden, Director
Study of Accreditation of Selected Health Educational Programs
58 Westcott Road
Princeton, New Jersey 08540
609-924-3733

Consumer Representatives

Area IV

Walter Dickinson
Exeuctive Director, TB Society
73 Whitehorse Pike
Hammonton, New Jersey
609-561-8700

Area III

William Leggestt, Sr.
39 Wayne Avenue
Trenton, New Jersey
609-695-8836

Area I

Audrey H. Massiah
Division of Public Welfare
102 Washington Street
Newark, New Jersey 07102
201-733-7663

Area II

Aurora Garcia, Asst. Vice-Pres.
The Trust Company of New Jersey
Bergen Line Avenue at 32nd Street
Union City, New Jersey 07087
201-653-4100 ext. 233

Department of Education, Division of Vocational Education

Joan Birchenall, R.N., M.Ed.
Director, Health Occupations
Division of Vocational Education
Department of Education
225 West State Street
Trenton, New Jersey 08625
609-292-6592

Elizabeth V. Moore, R.N., M.Ed.
Consultant, Health Careers
Division of Vocational Education
Department of Education
225 West State Street
Trenton, New Jersey 08625
609-292-6593

Department of Higher Education (Non-voting - Executive Secretary, HPEAC)

Edward Cohen, Director
Office of Health Professions Education
225 West State Street
Trenton, New Jersey 08625
609-292-6592

Professional Associations

3 Members and Alternates
to be appointed by:
- New Jersey Medical Society
- New Jersey Dental Association
- New Jersey State Nurses Association

APPENDIX F of the Health Professions Education Master Plan

INVENTORY OF HEALTH PROFESSIONS EDUCATION PROGRAMS

State of New Jersey, Department of Higher Education
Office of Health Professions Education

May 1973

APPENDIX F of the Health Professions Education Master Plan

INVENTORY OF HEALTH PROFESSIONS EDUCATION PROGRAMS

State of New Jersey, Department of Higher Education
Office of Health Professions Education

This inventory includes post-secondary level health occupations education programs offered in New Jersey colleges and hospitals. When an occupational program is offered at both the secondary and post-secondary level, the secondary institutions have also been included. For the most part, the data have been supplied by the institutions. Graduates: The graduate figures given include all graduates during the fiscal year listed. For example, any student graduating from July 1st, 1969 to June 30th, 1970 is listed as a 1970 graduate. Enrollment: The enrollment figures are for the fall of the year listed and are full time equivalents (FTE): three part time students are considered to be equal to one full time equivalent student. Areas: Areas 1 through 4 refer to the Comprehensive Health Planning Areas of the Department of Health's Comprehensive Health Planning Agency. N/P means that the data were not provided by the institution.

	Page
Animal Technicians	7
Cytotechnologists	7
Dental Assistants	8
Dental Hygienists	10
Dental Laboratory Technicians	11
Dentists	11
Dietitians	12
Health Care Managers	12
Health Educators & Information Specialists	13
Medical Assistants	14
Medical Laboratory Technicians	15
Medical Record Technicians	17
Medical Secretary	17
Medical Technologists	19
Nurses	23
Occupational Therapist Assistants	28
Opthalmic Technicians	28
Pharmacists	29
Physical Therapist Assistants	29
Physicians	30
Radiologic Technologists	31
Recreation Aides	34
Rehabilitation Assistants	34
Respiratory Therapists	35
Respiratory Therapist Technicians	36
Speech & Communication Aides	37
Speech Pathologists & Audiologists	38

NOTE: The listing of a school or a program in this inventory does NOT necessarily mean that it is recognized, accredited or endorsed by its respective professional agency, association, or by the Department of Higher Education.

For further information, or to report errors or ommissions, please contact the Office of Health Professions Education, Department of Higher Education, 225 West State Street, Trenton, New Jersey 08625, (609) 292-8052.

May 1973

	Animal Technicians	Cytotechnologists	Dental Assistants	Dental Hygienists	Dental Lab. Technicians	Dentists	Dietitians	Health Care Managers	Health Educators	Medical Assistants	Medical Lab. Technicians	Medical Record Techs.	Medical Secretaries	Medical Technologists	Nurses	Occup. Therapist Ass'ts.	Opthalmic Technicians	Pharmacists	Physical Therapist Ass'ts.	Physicians	Radiologic Technologists	Recreation Aides	Rehabilitation Assistants	Respiratory Therapists	Respir. Therap. Techs.	Speech & Commun. Aides	Speech Path./Audiologists
●PUBLIC - 2 YEAR COLLEGES																											
Atlantic Community College											3				3	3			3			3		3		3	
Bergen Community College				3						3	3				3						3			3			
Brookdale Community College											3				3									3			
Burlington County College											3		3														
Camden County College	3			3							3						3										
County College of Morris			2								3				3												
Cumberland County College															3												
Essex County College								3				3	3		3				3		3						
Gloucester County College															3												
Mercer County Comm. College			4								3				3						3						
Middlesex County College				3							3				3						3	3					
Ocean County College															3												
Passaic County Comm. College															3						3				2		
Somerset County College															3												
Union County Tech. Institute			2	3	3					2	3																
●INDEPENDENT - 2 YEAR COLLEGES																											
Centenary College for Women		3												5													
●STATE COLLEGES																											
Jersey City State College									8																		5
Montclair State College							5		8																		8
Newark State College														5													8
Trenton State College									5						5												8
Wm. Paterson State College															5												8
●RUTGERS UNIVERSITY																											
Coll. of Arts & Sci., Camden														5													
Coll. of Arts & Sci., Newark														5													
Coll. of Nursing, Newark															5												
Coll. of Pharmacy, New Bruns.																		5									
Douglass College							8							5													8
Graduate Sch., New Bruns.															7												
●Coll. of Med. & Dent. of N.J.		0	0			9								0						9	0				0		
●INDEPENDENT 4-YR COLL.& UNIV.																											
Bloomfield College															5												
Caldwell College														5													
College of St. Elizabeth							5																				
Fairleigh Dickinson Univer.				6		9								5	5				3		6			3			
Felician College															5												
Monmouth College											3			5													
Seton Hall University														5	5												8
●INDEPENDENT POST-SECONDARY SCHOOLS																											
Berdan Institute													θ														
Bryman School			θ							θ			θ														
Cherry Hill Sch. of Business													θ														
Dover Business College													θ														
Essex College of Business													θ														
Health Careers Institute			θ							θ																	
Inst.for Adv. of Med. Sci.																					0				2		
Lyons Educational Centers			1		1					1			1														
Roberts, Walsh Stenotype Sch.													θ														
●AREA VOC. TECH. & HIGH SCHOOLS																											
Atlantic City Area Voc. Tech.										1																	
Bergen Co. Area Voc. Tech.			1																								
Bergen AVTS-Tech. Trng. Cntr.			θ																								
Camden Cc. AVTS, Sicklerville			θ		θ					θ																	

CREDENTIAL AWARDED

1-Diploma

2-Certificate

3-Associate Degree

4-Certificate and Associate Degree

5-Bachelors Degree

6-Associate and Bachelors Degrees

7-Masters Degree

8-Bachelors and Masters Degrees

9-Professional Degree: MD; DMD

0-No Credential Awarded

θ-Credential Not Reported

	Animal Technicians	Cytotechnologists	Dental Assistants	Dental Hygienists	Dental Lab. Technicians	Dentists	Dietitians	Health Care Managers	Health Educators	Medical Assistants	Medical Lab. Technicians	Medical Record Techs.	Medical Secretaries	Medical Technologists	Nurses	Occup. Therapist Ass'ts.	Opthalmic Technicians	Pharmacists	Physical Therapist Ass'ts	Physicians	Radiologic Technologists	Recreation Aides	Rehabilitation Assistants	Respiratory Therapists	Respir. Therap. Techs.	Speech & Comm. Aides	Speech Path/Audiologists
AREA VOC.TECH. & HIGH SCHOOLS (continued)																											
Cape May Co. Voc.& Tech. Sch.										1																	
Essex Area Voc. Tech			θ																								
Madison Twp. High School										1																	
Monmouth Co. Voc. School										1																	
Ocean Co. Area Voc.& Tech.Sch			1																								
Salem Co. Area Voc.Tech.Sch.													1														
Union Twp. Area Voc. Tech.			1																								
HOSPITALS																											
Alexian Brothers Hospital																									θ		
Atlantic City Hospital		θ																			0						
Barnert Memorial Hospital														0													
Bayonne Hospital															1						0						
Bergen Pines Co. Hospital														0							2						
Bridgeton Hospital																					2						
Burdette Tomlin Mem. Hospital																					0						
Burlington Co. Mem. Hospital																					2				2		
Christ Hospital															1						0						
Clara Maass Memorial Hospital															1						0						
Cooper Hospital														0	1						0						
Dover General Hospital																									2		
East Orange General Hospital															1												
Elizabeth General Hospital															1												
Englewood Hospital														0	1						θ						
Hackensack Hospital														0							0						
Helene Fuld Hospital, Trenton															1						0						
Holy Name Hospital															1												
Hospital Center at Orange														0	1												
Hunterdon Medical Center																					0						
Jersey City Medical Center																					0				θ		
Jersey Shore Medical Center														0	1												
Memorial General Hospital																					1						
Mercer Hospital															1						0						
Monmouth Medical Center														0							θ						
Morristown Memorial Hospital														0							2						
Mountainside Hospital														0	1						0				θ		
Muhlenberg Hospital		2												2	1						2						
Newark Beth Israel														0													
Newcomb Hospital																					0						
No. Hudson Hosp.,Weehauken																									2		
Our Lady of Lourdes															1						0						
Overlook Hospital																					0						
Pascack Valley Hospital																					0						
Passaic Tri-Hosp. Sch. of R.T.																					0						
Perth Amboy General Hospital															1												
Princeton Hospital														0							0						
Riverview Hospital														0							0						
St. Barnabas Medical Center														0											2		
St. Francis Comm. Health Cent.															1												
St. Francis Hosp., Trenton														0	1						0						
St. Joseph's Hosp.,Paterson														0													
St. Mary Hospital, Hoboken														0	1												
St. Mary's Hospital, Passaic														0													
St. Michael Medical Center														0							0						
St. Peter's Gen.Hosp.														0	1												
Somerset Hospital														0													
United Hospital of Newark														0													
Valley Hospital, Ridgewood														0							0						
West Jersey Hospital, Camden														0	1						0				0		

CREDENTIAL AWARDED

1-Diploma
2-Certificate
3-Associate Degree
4-Certificate and Associate Degree
5-Bachelors Degree
6-Associate and Bachelors Degrees
7-Masters Degree
8-Bachelors and Masters Degrees
9-Professional Degree: MD; DMD
0-No Credential Awarded
θ-Credential Not Reported

PUBLIC - 2 YEAR COLLEGES

ATLANTIC COMMUNITY COLLEGE
Mays Landing 08330
609-625-1111

BERGEN COMMUNITY COLLEGE
400 Paramus Road
Paramus 07652
201-447-1500

BROOKDALE COMM. COLLEGE
765 Newman Springs Road
Lincroft 07738
201-842-1900

BURLINGTON COUNTY COLLEGE
Pemberton-Browns Mills Rd.
Pemberton 08068
609-894-9311

CAMDEN COUNTY COLLEGE
P. O. Box 200
Blackwood 08012
609-227-7200

COUNTY COLLEGE OF MORRIS
Rte 10 & Centergrove Rd., RD#1
Dover 07801
201-361-5000

CUMBERLAND COUNTY COLLEGE
P. O. Box 517
Vineland 08360
609-691-8600

ESSEX COUNTY COLLEGE
Allied Health Division
Newark 07102
201-621-2200

GLOUCESTER COUNTY COLLEGE
Tanyard & Salina Road
Sewell R.D., 08080

MERCER COUNTY COMM. COLLEGE
P. O. Box B
Trenton 08690
609-586-4800

MIDDLESEX COUNTY COLLEGE
Edison 08817
201-548-6000

OCEAN COUNTY COLLEGE
Hooper Avenue
Toms River 08753
201-255-4000

PASSAIC CTY. COMM. COLLEGE
170 Paterson Street
Paterson 07575
201-279-5000

SOMERSET COUNTY COLLEGE
P. O. Box 3300
Somerville 08876
201-526-1200

UNION CTY. TECH. INSTITUTE
1776 Raritan Road
Scotch Plains 07076
201-889-2000

INDEPENDENT - 2 YEAR COLLEGES

CENTENARY COLL. FOR WOMEN
Hackettstown 07840

STATE COLLEGES

JERSEY CITY STATE COLLEGE
Jersey City 07305
201-547-6000

MONTCLAIR STATE COLLEGE
Montclair 07043
201-893-4000

NEWARK STATE COLLEGE
Union 07083
201-527-2000

TRENTON STATE COLLEGE
Trenton 08625
609-771-1855

WM. PATERSON STATE COLLEGE
Wayne 07470
201-881-2000

RUTGERS UNIVERSITY

College of Arts & Science
Camden 08102
609-964-1766

College of Arts & Science
Newark 07102
201-621-1766

College of Nursing
Newark 07102
201-621-1766

College of Pharmacy
New Brunswick 08903
201-247-1766

Douglass College
New Brunswick 08903
201-247-1766

CMDNJ

NEW JERSEY MEDICAL SCHOOL
100 Bergen Street
Newark 07103
201-877-4300

NEW JERSEY DENTAL SCHOOL
201 Cornelison Avenue
Jersey City 07304
201-877-4300

RUTGERS MEDICAL SCHOOL
P. O. Box 2100
New Brunswick 08903
201-247-1766

INDEPENDENT 4-YR. COLL. & UNIV.

BLOOMFIELD COLLEGE
467 Franklin Street
Bloomfield 07003
201-748-9000

CALDWELL COLLEGE
Bryerson Avenue
Caldwell 07006
201-228-4424

COLLEGE OF ST. ELIZABETH
Convent Station 07961
201-539-1600

FAIRLEIGH DICKINSON UNIVER.
Madison 07940
201-377-4700
Rutherford 07070
201-933-5000
Teaneck 07666
201-836-6300

FELICIAN COLLEGE
So. Main Street
Lodi07644
201-778-1190

MONMOUTH COLLEGE
W. Long Branch 07764
201-222-6600

SETON HALL UNIVERSITY
So. Orange Avenue
So. Orange 07074
201-762-9000

INDEPENDENT POST-SECONDARY SCH.

BERDAN INSTITUTE
744 Hamburg Turnpike
Pompton Lakes
201-835-5552

BRYMAN SCHOOL
Rte 18
East Brunswick 08816
201-249-9383

CHERRY HILL SCHOOL OF BUSIN.
496 North Kings Highway
herry Hill 08101
609-667-8244

DOVER BUSINESS SCHOOL
15 E. Blackwell Street
Dover 07801
201-366-6700

ESSEX COLLEGE OF BUSINESS
790 Broad Street
Newark 07102
201-642-0480

HEALTH CAREERS INSTITUTE
7 Harrison Avenue
Morris Plains 07950
201-267-4900

INST. OF ADV. OF MED. SCIENCE
Cherry Hill Medical Center
Cherry Hill 08034
609-665-2000

LYONS EDUCATIONAL CENTER
342 Main Street
Hackensack 07601
201-488-3790
900 Broad Street
Newark 07102
201-642-3420

AREA VOC. TECH & HIGH SCHOOLS

ATLANTIC CITY AREA VOC./TECH.
1 North Illinois Ave.
Atlantic City 08401
609-344-1269

BERGEN CO. AREA VOC/TECH.
200 Hackensack Avenue
Hackensack 07601

BERGEN AVTS-TECH. TRNG. CENT.
280 Hackensack Avenue
Hackensack 07601
201-343-6829

AREA VOC. TECH.& HIGH SCHOOLS
(Continued)

CAMDEN CO. AREA VOC/TECH.
Box 566, Berlin-Cross Keys Rd.
Sicklerville 08081
609-767-7000

CAPE MAY CO. AREA VOC/TECH.
Crest Haven Road
Cape May Court House 08210
609-465-4117

ESSEX CO. AREA VOC/TECH.
300 North 13th Street
Newark 07017
201-961-7790

MADISON TWP. HIGH SCHOOL
Route 516
Matawan 07747
201-566-1000

MONMOUTH CO. AREA VOC/TECH
P. O. Box 838
Freehold 07728
201-431-4000

OCEAN CO. AREA VOC/TECH.
West Water Street
Toms River 08753
2010349-8425

SALEM CO. AREA VOC/TECH.
Jochen Laboratory
Penns Grove 08069
609-299-2100

UNION TWP. AREA VOC/TECH.
North 3rd Street
Union 07083
201-688-1200

HOSPITALS

ALEXIAN BROTHERS HOSP.
655 E. Jersey St.
Elizabeth 07206
201-351-9000

ATLANTIC CITY HOSP.
1925 Pacific Avenue
Atlantic City 08401
609-344-4081

BARNERT MEMORIAL HOSP. CTR.
680 Broadway
Paterson 07514
201-274-8000

BAYONNE HOSPITAL
29 East 29th Street
Bayonne 07002

BERGEN PINES COUNTY HOSP.
E. Ridgewood Avenue
Paramus 07652
201-261-9000

BRIDGETON HOSPITAL
Irving & Magnolia Aves.
Bridgeton 08302
609-451-6600

BURDETTE TOMLIN MEM. HOSP.
Stone Harbor Blvd.
Cape May Court House 08210

BURLINGTON CTY. MEM. HOSP.
175 Madison Ave.
Mt. Holly 08060
609-267-0700

CHRIST HOSPITAL
176 Palisade Ave.
Jersey City 07306
201-653-1220

CLARA MAASS MEMORIAL HOSP.
Franklin Avenue
Belleville 07109
201-751-1000

COOPER HOSPITAL
6th & Stevens St.
Camden 08103
609-964-6600

DOVER GENERAL HOSPITAL
Jardine Street
Dover 07801
201-366-1600

EAST ORANGE GENERAL HOSP.
300 Central Ave.
E. Orange 07109
201-672-8400

ELIZABETH GEN. HOSP.& DISP.
925 E. Jersey St.
Elizabeth 07201
201-289-8600

ENGLEWOOD HOSPITAL
350 Engle St.
Englewood 07631
201-568-3400

HACKENSACK HOSPITAL
22 Hospital Place
Hackensack 07601
201-487-4000

HELENE FULD HOSPITAL
750 Brunswick Ave.
Trenton 08638
609-396-6575

HOLY NAME HOSPITAL
718 Teaneck Road
Teaneck 07666
201-837-3070

HOSPITAL CENTER AT ORANGE
188 S. Essex Avenue
Orange 07051
201-678-1100

HUNTERDON MEDICAL CENTER
Rt. 31
Flemington 08822
201-782-2121

JERSEY CITY MEDICAL CENTER
50 Baldwin Avenue
Jersey City 07304
201-433-7000

JERSEY SHORE MEDICAL CENTER
1945 Corlies Avenue
Neptune 07753
201-775-5500

MEMORIAL GENERAL HOSPITAL
1000 Galloping Hill Rd.
Union 07083
201-687-1900

MERCER HOSPITAL
446 Bellevue Avenue
Trenton 08607
609-396-4070

MONMOUTH MEDICAL CENTER
3rd & Pavilion Aves.
Long Branch 07740
201-222-5200

MORRISTOWN MEM. HOSP.
100 Madison Avenue
Morristown 07960
201-538-4500

MOUNTAINSIDE HOSPITAL
Bay & Highland Avenues
Montclair 07042
201-746-6000

MUHLENBERG HOSPITAL
Park Ave. & Randolph Rd.
Plainfield 07061
201-753-2000

NEWARK BETH ISRAEL HOSP.
201 Lyons Avenue
Newark 07112
201-WA3-6000

NEWCOMB HOSPITAL
66 S. State Street
Vineland 08360
609-691-9000

NO. HUDSON HOSPITAL
4300 Park Avenue
Weekhauken 07087
201-863-1900

OUR LADY OF LOURDES HOSP.
1600 Haddon Avenue
Camden 08103
609-963-4300

OVERLOOK HOSPITAL
193 Morris Avenue
Summit 07901
201-273-8100

PASCACK VALLEY HOSPITAL
Old Hook Road
Westwood 07675
201-664-4000

PASSAIC TRI-HOSP. SCHOOL
OF RAD. TECH.
350 Blvd.
Passaid 07055
201-473-8000

PERTH AMBOY GENERAL HOSP.
530 New Brunswick Av
Perth Amboy 08861
201-442-3700

PRINCETON HOSPITAL
Witherspoon Street
Princeton 08540
609-921-7700

RIVERVIEW HOSPITAL
35 Union Street
Red Bank 07701
201-741-2700

ST. BARNABAS MED. CENTER
Old Short Hills Road
Livingston 07039
201-992-5500

HOSPITALS
(Continued)

ST. FRANCIS COMM. HEALTH CENT.
One McWilliams Place
Jersey City 07302
201-792-6000

ST. FRANCIS HOSPITAL
601 Hamilton Avenue
Trenton 08629
609-396-7676

ST. JOSEPH'S HOSPITAL
703 Main Street
Paterson 07503
201-684-7500

ST. MARY HOSPITAL
4th & Willow Avenue
Hoboken 07030
201-792-3300

ST. MARY'S HOSPITAL
211 Pennington Avenue
Passaic 07055
201-473-1000

ST. MICHAEL MEDICAL CENTER
306 High Street
Newark 07102
201-623-8200

ST. PETER'S GENERAL HOSP.
254 Easton Avenue
New Brunswick 08903
201-545-8000

SOMERSET HOSPITAL
Rehill Avenue
Somerville 08876
201-725-4000

UNITED HOSPITALS OF NEWARK
15 S. Ninth Street
Newark 07107
201-484-8000

VALLEY HOSPITAL
Linwood & N. Van Dien Ave.
Ridgewood 07451
201-445-4900

WEST JERSEY HOSPITAL
M. Ephriam & Atlantic Aves.
Camden 08104
609-963-8830

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
ANIMAL TECHNICIANS											
AREA 4											
Camden County											
Camden Co. College, Blackwood	Animal Medical Center, N.Y.	2 yr.	Assoc.	0	0	27	60	0	0	0	0
CYTOTECHNOLOGISTS											
AREA 2											
Union County											
*Muhlenberg Hosp., Plainfield	Not provided	1 yr.	Cert.	3	3	1	3	3	3	1	3
Warren County											
Centenary College for Women, Hackettstown	No formal affiliations	2 yr.	Assoc.	0	1	2	5	0	0	0	1
AREA 4											
Atlantic County											
*Atlantic City Hosp., Atlantic City	Not provided	1 yr.	N/P	0	2	2	2-6	0	2	2	2

* Approved by the Council on Med. Educ. of the AMA in collaboration with the Am. Soc. of Clin. Path. and the Am. Soc. of Med. Tech., 1972.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
DENTAL ASSISTANTS											
AREA 1											
Bergen County											
Bergen Co. Area Voc. Tech Sch., Hackensack	Not provided	1 yr.	H.S.Dip.	30	66	(1) 66	(1) 66	(1) 25	(1) 25	58	(1) 60
Bergen Technical Training Ctr. Hackensack	Not provided	N/P	N/P	N/P	66	N/P	N/P	N/P	N/P	59	N/P
Lyons Educa. Ctr., Dent. Div., Hackensack	None	6 mo.	Dipl.	(1) 40	40	(1) 35	70	(1) 35	36	35	60
Hudson County											
CMDNJ, N.J. Dental School, Jersey City (Beg. 3/73)	Not provided	44 wk.	Certif.	0	0	0	60	0	0	0	0
AREA 2											
Essex County											
Essex Area Voc. Tech. School, Newark	Not provided	N/P	N/P	40	37	(1) 40	(1) 40	(1) 35	(1) 35	27	(1) 35
Lyons Educa. Ctr. Dental Div., Newark	None	6 mo.	Diplo.	(1) 60	62	(1) 44	80	44	52	54	70
Morris County											
Co. College of Morris, Dover (Beg. 9/73)	Not provided	1 yr.	Cert.	0	0	0	60	0	0	0	0
Health Careers Inst., Morris Plains	Not provided	N/P	N/P	0	15	(1) 58	80	0	0	26	55
Union County											
Union Co. Tech. Inst., Scotch Plains	CMDNJ, Newark; Fairleigh Dickinson Dental College; E. Orange V.A. Hospital	1 yr.	Cert.	18	21	20	40	13	14	21	20
Union Twp. Area Voc. Tech. Sch., Union	Not provided	1 yr.	H.S.Dip.	27	30	(1) 30	(1) 30	(1) 25	(1) 25	29	(1) 28

(1) DHE/OHPE estimates.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
DENTAL ASSISTANTS (continued)											
AREA 3											
Mercer County											
Mercer Co. Community College, Trenton	Walson Army Hospital, Ft. Dix	1 yr. 2 yr.	Certif. Assoc.	0 0	}23	20 18	20 20	0 0	0 0	20 2	15 5
Middlesex County											
The Bryman School, E. Bruns.	Not provided	N/P	N/P	42	53	135	160	37	44	72	90
Ocean County											
Ocean Co. AVTS, Toms River	Not provided	1 yr.	H.S.Dip	31	39	(1) 35	(1) 35	(1) 28	(1) 28	36	(1) 32
AREA 4											
Camden County											
Camden Co. Voc. Tech. Sch., Sicklerville	Not provided	N/P	N/P	16	18	(1) 17	(1) 17	(1) 15	(1) 15	17	(1) 16

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
DENTAL HYGIENISTS											
AREA 1											
Bergen County											
Bergen Community College, Paramus	Not provided	2 yr.	Assoc.	0	0	28	50	0	0	0	0
Fairleigh Dickinson Univ., Teaneck	Not provided	4 yr. 2 yr.	Bacc.(2) Assoc.	9 86	10 120	10 111	23 23	12 41	7 33	13 33	13 33
AREA 2											
Union County											
Union Co. Tech. Inst., Scotch Plains	Union College; CMDNJ, Martland Hospital; V.A. Hosp.; and Newark Beth Israel Hosp.	2 yr.	Assoc.	28	33	34	80	0	11	13	15
AREA 3											
Middlesex County											
Middlesex County College, Edison	Not provided	2 yr.	Assoc.	26	53	54	88	0	0	22	24
AREA 4											
Camden County											
Camden County College, Blackwood	None	2 yr.	Assoc.	19	23	24	30	0	10	10	11

(2) Enrollment data are for upper division only.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
DENTAL LABORATORY TECHNICIANS											
AREA 1											
Bergen County											
Lyons Educa. Ctr., Health Careers Div., Hackensack	None	18 mo.	Dipl.	(1) 9	9	17	40	(1) 8	8	15	25
AREA 2											
Essex County											
Lyons Educa. Ctr., Dental Div., Newark	None	18 mo.	Dipl.	(1) 50	62	(1) 75	80	45	45	38	55
Union County											
Union Co. Tech. Inst., Scotch Plains	CMDNJ, Newark	2 yr.	Assoc.	0	12	29	40	0	0	0	10
AREA 4											
Camden County											
Camden Co. Area Voc. Tech Sch., Sicklerville	Not provided	N/P	N/P	N/P	12	N/P	N/P	N/P	N/P	10	N/P
DENTISTS											
AREA 1											
Bergen County											
Fairleigh Dickinson Univ., School of Dentistry, Hackensack	Not provided	4 yr. Post-Bacc	D.M.D.	230	251	284	300	49	53	48	51
Hudson County											
CMDNJ, New Jersey Dental Sch., Jersey City (Will move to Newark)	Martland Hospital, Jersey City Med. Center, and E. Orange V.A. Hospital	3 yr. Post-Bacc	D.M.D.	211	227	243	256	42	41	59	60

(1) DHE/OHPE estimate

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
DIETITIANS											
AREA 2											
Essex County											
Montclair State College, Montclair	Not provided	4 yr.	Bacc.	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Morris County											
College of St. Elizabeth, Convent Station	None	4 yr.	Bacc.(2)	10	12	16	28	9	5	5	7
AREA 3											
Middlesex County											
Douglass College, Rutgers U. New Brunswick	Hospitals: E. Orange V.A., J.F. Kennedy and Perth Amboy General. Middlesex Co. College and Coll. of St. Eliz.	4 yr. 1-3 yrs.	Bacc.(2) Mast.	12 6	18 10	21 10	40 13	7 6	7 13	12 6	10 12
HEALTH CARE MANAGERS											
AREA 2											
Essex County											
Essex Co. College, Newark (Unit Manager Program)	Newark Beth Israel Hosp. & Martland Hospital	2 yr.	Assoc.	(1) 2	2	9	10	2	1	1	1

(1) DHE/OHPE estimate.
(2) Enrollment data for upper division only.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDEN-TIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
HEALTH EDUCATORS & INFORMATION SPECIALISTS											
AREA 1											
Hudson County											
Jersey City State College, Jersey City	Not provided	4 yr. N/P	(2) Bacc. Mast.	12 11	213 19	243 42	358 75	167 11	226 7	330 27	290 27
AREA 2											
Essex County											
Montclair State College, Montclair	Not provided	4 yr. 1 yr.	Bacc. Mast	N/P 23	N/P 17	20 N/P	N/P N/P	N/P N/P	N/P 6	N/P 51	N/P N/P
AREA 3											
Mercer County											
Trenton State College, Trenton	Not provided	4 yr.	Bacc.	26	39	52	(1) 52	3	7	8	7

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(1) DHE/OHPE estimate.

(2) Enrollment data for upper division only.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
MEDICAL ASSISTANTS											
AREA 1											
Bergen County											
Bergen Comm. College, Paramus	Hosps: Pascack Valley, Barnert Mem.; 12 physicians offices	2 yr	Assoc	0	0	26	52	0	0	0	0
Lyons Educational Ctr., Hackensack	None	1 yr.	Dip.	(1) 24	26	(1) 52	60	(1) 20	22	24	50
AREA 2											
Essex County											
Essex Co. Area Voc. Tech. Sch. Newark	Not provided	N/P	N/P	30	21	N/P	N/P	N/P	N/P	14	N/P
Lyons Educational Center, Newark	None	1 yr.	Dipl.	(1) 50	59	(1) 45	75	(1) 40	44	37	50
Morris County											
Health Careers Inst., Morris Plains	Not provided	N/P	N/P	0	0	(1) 45	60	0	0	0	55
Union County											
Union Co. Tech. Inst., Scotch Plains	Hosps: Elizabeth Gen., Muhlenberg & Overlook	1 yr.	Cert.	23	26	47	50	12	22	25	40
AREA 3											
Middlesex County											
The Bryman School, East Brunswick	None	N/P	N/P	48	84	142	170	42	73	79	95
*Madison Twp. High School, Matawan	Not provided	N/P	H.S.Dipl	N/P	65	N/P	N/P	N/P	N/P	65	N/P
Monmouth County											
*Monmouth Co. Area Voc. Tech. Sch., Freehold	Not provided	N/P	H.S.Dipl	38	55	N/P	N/P	N/P	N/P	48	N/P

* Program offered as "Medical-Dental Assistant".

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDEN-TIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
MEDICAL ASSISTANTS (Continued)											
AREA 4											
Atlantic County											
*Atlantic City High School, Atlantic City	Not provided	1 yr.	H.S. Dipl	0	27	N/P	N/P	N/P	N/P	26	N/P
Camden County											
Camden Co. Area Voc. Tech. Sch., Sicklerville	Not provided	N/P	N/P	N/P	14	N/P	N/P	N/P	N/P	9	N/P
Cape May County											
*Cape May Co. Area Voc. Tech. Sch., Cape May Ct. Hse.	Not provided	N/P	H.S.Dipl	51	46	N/P	N/P	N/P	N/P	32	N/P
MEDICAL LABORATORY TECHNICIANS											
AREA 1											
Bergen County											
Bergen Community College, Paramus	Holy Name Hosp., Pascack Valley Hosp. St. Joseph's Hosp.	2 yr.	Assoc.	0	0	34	58	0	0	0	0
AREA 2											
Morris County											
County College of Morris, Dover	Not provided	2 yr.	Assoc.	43	56	65	75	7	12	6	12
Union County											
Union Co. Tech. Inst., Scotch Plains	Overlook Hosp., Elizabeth Gen. Hosp.	2 yr.	Assoc.	27	39	37	40	0	5	13	14

*Program offered as "Medical-Dental Assistant"

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
							Est				Est
				70	71	72	75	70	71	72	73
MEDICAL LABORATORY TECHNICIANS (Continued)											
AREA 3											
Mercer County											
Mercer Co. Comm. College, Trenton (Beg. 9/73)	Hospitals: Hamilton, Helene Fuld, Mercer, and St. Francis	2 yr.	Assoc.	0	0	0	40	0	0	0	0
Middlesex County											
Middlesex County College, Edison	Not provided	2 yr.	Assoc.	0	29	50	55	0	0	0	10
Monmouth County											
Brookdale Comm. Coll. Lincroft	Hospitals: Ft. Paterson, Freehold, Jersey Shore Med. Center, Monmouth Med. Center and Riverview	2 yr.	Assoc.	(1) 24	(1) 39	(1) 64	(1) 64	0	3	5	12
Monmouth College, West Long Branch	Not provided	2 yr.	Assoc.	19	7	7	5	1	2	1	1
AREA 4											
Atlantic County											
Atlantic Comm. College, Mays Landing	Not provided	2 yr.	Assoc.	8	14	23	40	7	5	3	16
Burlington County											
Burlington County College, Pemberton	Deborah Hosp., Burl. Co. Mem. Hosp., Zurburgg Hosp., Rancocus Valley Hosp.	2 yr.	Assoc.	23	45	72	85	0	1	4	13
Camden County											
Camden County College, Blackwood	Our Lady of Lourdes Hospital	2 yr.	Assoc.	(1) 18	(1) 22	(1) 31	(1) 50	2	8	10	12

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
MEDICAL RECORD TECHNICIANS											
AREA 2											
Essex County											
Essex County College, Newark	Newark Rehabilitation Assoc. and Martland Hospital	2 yr.	Assoc.	3	11	22	20	1	0	3	0
MEDICAL SECRETARY											
AREA 1											
Bergen County											
Lyons Educational Center, Hackensack	Not provided	10 mons.	Dipl.	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Passic County											
Berdan Institute, Pompton Lakes	Not provided	1 yr.	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P
AREA 2											
Essex County											
Essex County College, Newark	Newark Beth Isreal Medical Center	2 yr.	Assoc.	N/P	14	40	60	0	1	0	1
Essex College of Business, Newark	Not provided	9 mons.	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Roberts, Walsh Stenotype Sch., East Orange	Not provided	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Morris County											
Dover Business College, Dover	Not provided	10 mons.	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS 70	71	72	Est 75	GRADUATES 70	71	72	Est 73
MEDICAL SECRETARY (Continued)											
AREA 3											
Middlesex County											
Bryman School, East Brunswick	Not provided	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P
AREA 4											
Burlington County											
Burlington County College, Pemberton	Not provided	2 yr.	Assoc.	0	0	25	47	0	0	0	12
Camden County											
Cherry Hill School of Business, Cherry Hill	Not provided	2 yr.	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Salem County											
Salem County Area Voc. Tech. School, Penns Grove	Not provided	1 yr.	Dipl.	N/P	N/P	N/P	N/P	N/P	N/P	N/P	N/P

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDEN-TIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
MEDICAL TECHNOLOGISTS											
A medical technologist must have a baccalaureate degree and one year of clinical experience in an AMA approved laboratory education program in medical technology. This listing is divided into 2 parts. The first part lists N.J. Colleges which offer a 4 year baccalaureate degree program for medical technologists including the year of clinical experience. The second part includes all hospitals in N.J. which offer one year of clinical education and experience.											
NEW JERSEY COLLEGES											
AREA 1											
Bergen County											
Fairleigh Dickinson Univ., Rutherford Campus	Hosp: Morristown Mem., Mountainside, Muhlenberg, Newcomb, Barnert Mem., Bergen Pines Co, Hackensack, Jersey Shore, Mercer, St. Joseph's, St. Mary's, St. Michaels, St. Peters, Somerset, E. Orange V.A., and U.S. Pub. Hlth. Ser. (Staten Isl.)	4 yr.	Bacc.	35	47	83	82	8	12	5	7
Fairleigh Dickinson Univ., Teaneck Campus	(See FDU affiliations Rutherford Campus)	4 yr.	Bacc.	48	66	88	92	15	5	10	10
AREA 2											
Essex County											
Caldwell College, Caldwell	Mountainside Hosp., St. Peter's Hosp., Englewood Hosp.	4 yr.	Bacc (2)	10	4	7	10	0	1	1	2
Rutgers Univ., Coll. of Arts & Sciences, Newark	Hospitals: Newark Beth Israel; United of Newark; Martland (tentative), and E. Orange V.A. (tentative).	4 yr.	Bacc (2)	14	24	41	40	4	10	11	12
Seton Hall Univ., Newark (Beg. 1/73)	CMDNJ, Martland Hospital	4 yr.	Bacc.	0	0	0	(1) 20	0	0	0	0
Morris County											
Fairleigh Dickinson Univ. Florham-Madison Campus, Madison	(See FDU affiliations Rutherford Campus)	4 yr.	Bacc.	43	56	61	67	8	7	12	12

(1) DHE/OHPE estimate.
(2) Enrollment data for upper division only.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDEN-TIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
MEDICAL TECHNOLOGISTS (Continued)											
Union County											
Newark State College, Union (Beg. 1/73)	Seton Hall Univ.; CMDNJ-Martland Hosp.	4 yr.	Bacc.	0	0	0	35	0	0	0	0
Warren County											
Centenary Coll. for Women, Hackettstown	Muhlenberg Hospital	4 yr.	Bacc.	0	12	11	15	4	2	1	2
AREA 3											
Middlesex County											
Douglass College, Rutgers Univ., New Brunswick	Muhlenberg Hosp., St. Peter's Hosp. (tentative)	4 yr.	Bacc.(2)	8	15	19	48	0	7	6	11
Monmouth County											
Monmouth College, West Long Branch	Monmouth Med. Center; Riverview Hosp.	4 yr.	Bacc.(2	0	14	43	40	0	0	3	5
AREA 4											
Camden County											
Rutgers University, Coll. of Arts & Sciences, Camden	Cooper Hospital	4 yr.	Bacc.(2)	13	11	11	21	3	6	4	6
HOSPITALS											
AREA 1											
Bergen County											
*Bergen Pines Co. Hosp, Paramus	Fairleigh Dickinson University	1 yr.	Cert.	5	7	4	4-5	8	5	6	3
*Englewood Hosp., Englewood	Caldwell Coll.; Fairleigh Dickinson	1 yr.	N/P	4	4	5	4	1	4	4	4
*Hackensack Hosp., Hackensack	FDU; Pace College, N.Y.; Wilkcs College, Pa., Marymount College, N.Y.	1 yr.	Cert.	8	7	11	10	9	4	6	10

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(2) Enrollment data for upper division only.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
MEDICAL TECHNOLOGISTS (Continued)											
*Valley Hospital, Ridgewood	Contracts pending with Fairleigh Dickinson Univ., and Univ. of Scranton, Pa.	1 yr.	Cert.	5	4	6	6	1	5	4	6
Hudson County											
*St. Mary Hospital, Hoboken	Richmond Coll. N.Y., Vermont College	1 yr.	N/P	3	4	3	4	2	3	4	3
Passaic County											
*Barnert Mem. Hosp., Paterson	FDU; University of Scranton	1 yr.	Cert.	6	7	8	10	4	6	7	8
*St. Joseph's Hosp., Paterson	FDU; University of Scranton	1 yr.	N/P	13	10	10	16	9	13	10	10
*St. Mary's Hosp., Passaic	Not provided	1 yr.	Cert.	7(1)	7(1)	7	8	7	7	7	7
AREA 2											
Essex County											
*Hosp. Center at Orange, Orange	Pace Coll., N.Y., Marymount Coll., N.Y., Vermont College	1 yr.	N/P	5	6	6	6	5	6	5	5
CMDNJ, Martland Hosp, Newark (Beg. 1/73)	Newark State Coll., Seton Hall Univ.	1 yr.	N/P	0	0	0	8	0	0	0	0
*Mountainside Hosp., Montclair	FDU, Caldwell Coll., Pace College, N.Y. Vermont Coll., Marymount Coll.,N.Y.	1 yr.	Cert.	7	8	8	8	6	7	8	8
*Newark Beth Israel Hosp., Newark	Rutgers, Newark	1 yr.	N/P	3	3	13	12	3	3	3	12
*St. Barnabas Med. Ctr., Livingston	Rutgers, FDU, Wilkes College, Pa.	1 yr.	N/P	12	6	12	8	14	10	5	10
*St. Michael Med. Ctr., Newark	FDU, Caldwell College	1 yr.	N/P	8	8	8	7	8	8	7	8
*United Hosp. of Newark	Rutgers University, Pace College	1 yr.	Cert.	0	0	6	12	0	6	12	0
Morris County											
*Morristown Mem. Hosp.	FDU, Colorado State	1 yr.	N/P	7	8	8	12	9	6	8	8
Union County											
*Muhlenberg Hosp., Plainfield	Douglass Coll.,Centenary Coll., FDU	1 yr.	Cert.	11	14	16	17	11	11	13	16

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(1) DHE/OHPE estimate

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
MEDICAL TECHNOLOGISTS (Continued)											
AREA 3											
Mercer County											
*Mercer Hospital, Trenton	Not provided	1 yr.	N/P	N/P	N/P	N/P	5	N/P	N/P	N/P	0
*Princeton Hosp., Princeton	No formal affiliations now.	1 yr.	N/P	9	8	6	8	8	9	8	6
*St. Francis Hosp., Trenton	Mercy College, Pa.	1 yr.	Cert.	13	12	14	15	12	12	14	13
Middlesex County											
*St. Peter's Gen. Hosp., New Brunswick	Caldwell College, FDU, Wagner & Richmond Colleges in N.Y.	1 yr.	N/P	8	8	8	8	8	8	8	8
Monmouth County											
*Jersey Shore Medical Center	FDU, Monmouth College, Univ. of N.Dakota	1 yr.	N/P	8	9	10	14	7	8	8	10
*Monmouth Med. Center, Long Branch	Monmouth College	1 yr.	N/P	13	14	12	15	15	13	14	12
Riverview Hospital, Red Bank	FDU, Monmouth College	1 yr.	N/P	1	0	1	10	1	0	1	3
Somerset County											
*Somerset Hospital, Somerville	FDU, Univ. of Scranton, Pa., Vermont College, Pace Coll., N.Y., Wilkes Coll. Pa.	1 yr.	Cert.	0	6	6	6	0	6	6	6
AREA 4											
Camden County											
*Cooper Hospital, Camden	Rutgers, Camden, Spring Garden Coll., Pa., Phil. Coll. of Pharmacy	1 yr.	Cert.	7	6	7	10	7	6	7	8
*West Jersey Hosp., Camden	Elizabethtown Coll., Pa. and Univ. of Scranton, Pa.	1 yr.	N/P	7	2	8	10	0	7	2	8

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OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
NURSES											
AREA 1											
Bergen County											
Bergen Community College, Paramus	HOSPITALS: Bergen Pines, Barnert Mem., Englewood, Hackensack, Overbrook, Pascack, Saddle Brook, St. Mary's and Valley. Daughters of Miriam Nursing Home and Woodcliffe Lakes Manor Home.	2 yr.	Assoc.	(1) 140	166	282	340	23	36	54	95
Englewood Hospital, Englewood	Ramapo College	2 yr.	Dipl.	90	102	107	120	34	49	41	48
Fairleigh Dickinson University, Rutherford	Not provided	4 yr.	Bacc.	77	115	167	350	0	0	15	18
Felician College, Lodi	Hospitals: St. Mary's, Orange, St. Mary's Passaic, St. James, United of Newark, Barnert Memorial, St. Joseph's, N.J. State, Greystone.	2 yr.	Assoc.	115	142	181	200	26	42	51	73
Hackensack Hospital, Hackensack (Close 2/73)	None	N/P	Dipl.	175	153	47	0	43	44	62	47
Holy Name Hospital, Teaneck	Hospitals: Columbia Presbyterian, N.Y, Elizabeth General, Rockland State, United of Newark and Valley. Englewood Cliffs College and Woodbridge State School	3 yr.	Dipl.	200	211	214	240	61	53	59	54
Hudson County											
Bayonne Hospital, Bayonne	Not provided	3 yr.	Dipl.	45	45	61	70-75	15	18	11	16
Christ Hospital, Jersey City	Jersey City State College	3 yr.	Dipl.	86	95	102	110	19	31	19	24
St. Francis Comm. Hlth. Ctr., Jersey City	Not provided,	30 mon.	Dipl.	109	137	142	160	29	43	36	50
St. Mary's Hospital, Hoboken	Rockland State Hospital	3 yr.	Dipl.	57	70	83	85	9	21	24	20
Passaic County											
Passaic Co. College, Paterson	Not provided	2 yr.	Assoc.	0	0	62	(1) 190	0	0	0	0

(1) DHE/OHPE estimate

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
NURSES (Continued)											
William Paterson State College, Wayne	Hospitals: Children's Specialized, Chilton Mem., Greystone, Newark Beth Israel, Passaic General, Paterson General, St. Joseph's, St. Mary's (Passaic) and Valley.	4 yr.	Bacc.(2)	62	108	133	150	21	36	45	56
AREA 2											
Essex County											
Bloomfield College, Bloomfield	Presbyterian Hospital, Newark	4 yr.	Bacc.	38	54	82	183	0	0	12	13
Clara Maass Memorial Hospital, Bellville	Upsala College	3 yr.	Dipl.	99	93	102	105	27	(1) 27	30	25
East Orange Gen. Hospital, East Orange	Upsala College; Essex Co. Hospital; Babies Hosp.-Columbia Presbyterian, NYC.	3 yr.	Dipl.	61	63	61	63	16	18	17	18
Essex County College, Newark	Hospitals: E. Orange V.A., Martland, Newark Beth Israel, Overbrook and United of Newark. Mt. Carmel Guild and Newark Extended Health Care Facility.	2 yr.	Assoc.	226	244	316	425	63	79	130	110
Orange Memorial Hospital (Hospital Ctr. at Orange)	Montclair State College, E. Orange V.A. Hospital	3 yr.	Dipl.	64	68	76	90	18	24	20	21
Mountainside Hospital, Montclair	Montclair State College, Essex County Hospital Center	3 yr.	Dipl.	171	196	203	200	45	61	59	70
Rutgers University, College of Nursing, Newark	Hospitals: Martland, St. Michaels, United of Newark, St. Mary's, E. Orange V.A., St. Barnabas, Overbrook. Other Nursing and Health Services.	4 yr.	Bacc.	232	247	264	387	48	43	48	70
Rutgers U., Coll. of Nursing-CMDNJ, Rutgers Medical School	(Joint Program - Pediatric Nurse Practitioner: Hunterdon Med. Center, Madison Health Dept., Middlesex Family Health Center, United Hosp. of Newark and Physicians Offices.	1 yr. Post Bacc	Cert.	0	0	7	14	0	0	0	6
Seton Hall University, South Orange	Hospitals: Children's Specialized, E. Orange V.A., Fair Oaks, Holy Name, Martland, Newark Beth Israel, Overlook, St. Barnabas, St. Elizabeth's, and St. Mary's (E. Orange). N.J. Assoc. for Retarded Children, public health departments and nursing services.	4 yr.	Bacc.	278	296	430	600	(1) 70	(1) 60	(1) 70	81
Morris County											
County College of Morris, Dover	Not provided	2 yrs.	Assoc.	145	151	170	320	39	38	65	56

(1) IHE/OHPE estimate
(2) Enrollment data for upper d[illegible]ion only.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
NURSES (Continued)											
Union County											
Elizabeth Gen. Hospital & Disp., Elizabeth	Union College-cooperative program; nurses receive an associate in science degree.	3 yr.	Dipl.	104	132	158	185	23	28	35	33
Muhlenberg Hospital, Plainfield	Union College-cooperative program; nurses receive an associate in science degree. Hospitals: Bonnie Brae, Childrens Specialized, Lyons V.A., and Marlboro.	3 yr.	Dipl.	148	188	199	212	36	46	49	49
AREA 3											
Mercer County											
Helene Fuld Hospital, Trenton	Not provided	3 yr.	Dipl.	86	88	94	105	21	29	32	26
Mercer Co. Comm. College, Trenton	Hospitals: Burl. Co. Mem., Freehold, (tentative), Hamilton (tentative), Helene Fuld, Hunterdon Med. Center, Mercer, Princeton, St. Francis and Walson. Carrier Clinic and Trenton Psychiatric Hospital	2 yr.	Assoc.	142	138	217	268	36	41	46	48
Mercer Hospital, Trenton	Mercer Co. Comm. College (basic sciences)	3 yr.	Dipl.	89	83	98	105-110	20	(1) 20	25	25
St. Francis Hospital, Trenton	Bainbridge Nursery School, Franklin School, Trenton Family Health Center Morris Hall, Trenton Psychiatric Hosp., Eastern State School, Pa.	2 yr.	Dipl.	61	62	62	62	39	27	52	50
Trenton State College, Trenton	Hospitals: Burlington Co., Hamilton, Princeton, Rancocas, St. Francis, and Trenton Psychiatric. Carrier Clinic, V.N.A. of Burlington and Middlesex Co's and Health Dept.'s of Hamilton Twp. and Trenton.	4 yr.	Bacc.	160	188	231	350	19	33	28	31
Middlesex County											
Middlesex County College, Edison	Alexian Bros. Hospital	2 yr.	Assoc.	196	258	364	390	64	62	55	130

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDEN-TIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
NURSES (Continued)											
Charles E. Gregory Sch. of Nursing, Perth Amboy Gene Hospital	Hospitals: Children's Specialized, Marlboro, and Middlesex Rehabilitation. Carrier Clinic, Middlesex Co. College, and Woodbridge Health Dept.	3 yr.	Dipl.	94	99	104	150	19	32	41	17
Rutgers University. Coll. of Nursing, New Brunswick	(Major - Psychiatric Nursing) Hospitals: Essex Co. at Overbrook, Elizabeth Gen., St. Peters and others. Rutgers Comm. Mental Health Center	2 yrs.	Mast.	19	19	24	23	4	9	7	10
St. Peter's Gen. Hospital, New Brunswick	University College, Rutgers University	3 yr.	Dipl.	107	119	117	125	28	24	35	38
Monmouth County											
Anne May School of Nursing, Jersey Shore Medical Center, Neptune	Monmouth College, Deborah Hospital, Marlboro Hospital and Arthur Brisbane Treatment Center.	3 yr.	Dipl.	80	105	123	136	31	26	19	20
Brookdale Comm. College, Lincroft	Hosp.: Ft. Paterson, Freehold, Jersey Shore, Marlboro, Monmouth & Riverview. County Agencies.	2 yr.	Assoc.	(1) 137	(1) 238	(1) 328	(1) 328	42	50	67	82
Ocean County											
Ocean County College, Toms River	Hosp: Comm. Memor., Pt. Pleasant, Paul Kimbal, Riverview, So. Ocean Co., N.J. Psychiatric Inst., Marlboro	2 yr.	Assoc.	88	86	113	137	28	31	29	32
Somerset County											
Somerset County College, Somerville	Hospitals: Somerset, Raritan Valley, Hunterdon Med. Center, Warren, Lyons V.A., Welkind Mem., Children's Specialized, and Carrier Clinic. Others.	2 yr.	Assoc.	47	53	60	207	0	15	24	25

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS			Est	GRADUATES			Est
				70	71	72	75	70	71	72	73
NURSES (Continued)											
AREA 4											
Atlantic County											
Atlantic Comm. College, Mays Landing	Not provided.	2 yr.	Assoc.	93	147	217	130	22	24	35	49
Camden County											
Cooper Hospital, Camden	Camden Co. College & Lakeland Hospital	3 yr.	Dipl.	69	75	79	110	24	17	27	26
Our Lady of Lourdes Hospital, Camden	Not provided.	2 yr.	Dipl.	84	80	90	90	21	29	28	22
Helene Fuld Sch. of Nursing, West Jersey Hospital, Camden	Camden Co. College (30 credits)	2 yr.	Dipl.	129	133	128	130	37	37	39	40
Cumberland County											
Cumberland County College, Vineland	Hospitals: Ancora State, Bridgeton, Cumberland, Millville, Newcomb & Salem. Day Care/Nursery Schools, Nursing Services, Rehabilitation & Guidance Center	2 yr.	Assoc.	69	86	101	112	23	23	36	44
Gloucester County											
Gloucester County College, Sewell	Hospitals: Ancora Psychiatric, Cherry Hill, Cooper, J. F. Kennedy, Underwood, West Jersey So. Div., United Cerebral Palsey Center, Visiting Nurse Assoc.	2 yr.	Assoc.	123	119	130	160	19	43	43	53

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS			Est	GRADUATES			Est
				70	71	72	75	70	71	72	73
OCCUPATIONAL THERAPIST ASSISTANTS											
AREA 4											
Atlantic County											
Atlantic Comm. Coll., Mays Landing (Beg. 9/73)	Not provided	2 yr.	Assoc.	0	0	0	20	0	0	0	0
OPTHALMIC TECHNICIANS											
AREA 4											
Camden County											
Camden County College Blackwood	Not provided	2 yr.	Assoc.	0	0	26	(1) 40	0	0	0	0

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
PHARMACISTS											
AREA 3											
Middlesex County											
Rutgers Univ., Coll. of Pharmacy, New Brunswick	Hospitals: Hackensack; United of Newark; Somerset, and St. Peter's	5 yrs.	Bacc.	354	441	520	575	40	37	54	64
PHYSICAL THERAPIST ASSISTANTS											
AREA 2											
Essex County											
Essex County College, Newark	Hosps: Overlook, Columbus, Mountainside, Newark Beth Israel, Union Mem., United of Newark & St. Barnabas. Bellville Cerebral Palsey Center, Teresa Grotto Extended Care Facility.	2 yr.	Assoc.	0	1	17	50	0	0	0	4
Morris County											
Fairleigh Dickinson Univ., Madison Campus (Beg. 1973)	Morristown Memorial Hospital	2 yr.	Assoc.	0	0	0	6	0	0	0	0
AREA 4											
Atlantic County											
Atlantic Comm. Coll., Mays Landing (Beg. 1/73)	Not provided	2 yr.	Assoc.	0	0	0	20	0	0	0	0

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
PHYSICIANS											
AREA 2											
Essex County											
CMDNJ, New Jersey Medical School, Newark	Hospitals: Martland (main teaching hosp.) E. Orange V.A., Jersey City Med. Cntr., Newark Beth Israel Med. Cntr., St. Michael's Med. Cntr., and United of Newark.	4 yr. Post-Bacc.	M.D.	335	393	447	450	72	77	87	108
AREA 3											
Middlesex County											
CMDNJ, Rutgers Medical School, Piscataway	Hospitals: Raritan Vally (main teaching hosp.), Hunterdon Med. Cntr., and Muhlenberg.	4 yr. Post-Bacc.	M.D.	0	0	32	64	0	0	0	0
	Graduates must transfer to 4 yr. M.D. degree granting institution. As of 9/72 32 students each year permitted to go on for 4 yrs. to M.D. degree at R.M.S.	2 yr. Post-Bacc.	M.M.S.	96	161	170	176	16	78	77	82

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
RADIOLOGIC TECHNOLOGISTS											
AREA 1											
Bergen County											
Bergen Community College, Paramus	Hospitals: Barnert Memorial, Bergen Pines Co., Englewood, Hackensack, Holy Name	2 yr.	Assoc.	0	0	28	52	0	0	0	0
*Bergen Pines Co. Hospital, Paramus	Not provided	2 yr.	Cert.	10	7	12	12	6	4	2	6
*Englewood Hosp., Englewood	Not provided	2 yr.	Cert.	N/P	N/P	18	N/P	N/P	N/P	N/P	6
*Hackensack Hosp., Hackensack	Not provided	2 yr.	N/P	10	15	17	18	3	5	6	7
*Pascack Valley Hosp., Westwood	Not provided	2 yr.	Cert.	4	3	11	14	4	3	7	4
*Valley Hospital, Ridgewood	Not provided	2 yr.	Cert.	8	11	15	18	0	3	5	6
Hudson County											
*Hudson Area School of Rad. Tech, Jersey City	Joint program-Bayonne & Christ Hosps.	2 yr.	Cert.	10	19	18	15	4	6	10	18
*Jersey City Medical Ctr., Jersey City	St. Mary Hosp., Hoboken; St. Francis Comm. Health Center	2 yr.	Cert.	15	29	17	20	8	11	10	17
Passaic County											
*Passaic Tri-Hosp. Sch. Rad. Tech., Passaic	Hospitals: E. Orange V.A., Newark Beth Israel, Passaic Gen. & St. Mary's	2 yr.	Cert.	9	12	20	20	9	10	17	19
Passaic County College, Wayne	Hospitals: Barnert Memorial, Chelton Memorial, Paterson General, St. Joseph's	2 yr.	Assoc.	0	0	32	45	0	0	0	25
AREA 2											
Essex County											
*Clara Maass Memorial Hosp., Bellville	Newark City Hosp., Presbyterian Hosp. Newark	2 yr.	Cert.	12	25	32	30	0	9	13	13

*Approved by the Council on Med. Educ. of the AMA in collaboration with the Am. Col. of Rad. and the Am. Soc. of Rad. Tech., 1972.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS 70	71	72	Est 75	GRADUATES 70	71	72	Est. 73
RADIOLOGIC TECHNOLOGISTS (Continued)											
Essex County College, Newark	E. Orange Gen. Hosp., United Hosp. of Newark and Newark Rehabiliation Assoc.	2 yr.	Assoc.	15	28	28	60	0	5	4	10
CMDNJ, Martland Hospital, Newark (Beg. '73)	Not provided	2 yr.	N/P	0	0	0	27	0	0	0	0
*Mountainside Hosp., Montclair	Not provided	2 yr.	Cert.	10	11	11	10	6	8	5	4
*St. Michael Med. Ctr., Newark	Not provided	2 yr.	Cert.	N/P	N/P	9	N/P	N/P	N/P	N/P	4
Morris County											
*Morristown Mem. Hosp.	Fairleigh Dickinson University	2 yr.	Cert.	15	15	20	30	3	8	7	5
Fairleigh Dickinson University, Madison Campus (Beg.'73)	Dover General Hospital Morristown Memorial Hospital	2 yr. 4 yr.	Assoc. Bacc.	0 0	0 0	0 0	6 (2) 9	0 0	0 0	0 0	0 0
Union County											
Memorial General Hospital, Union	St. Elizabeth Hospital	2 yr.	Dip.	0	6	5	3	0	0	0	3
*Muhlenberg Hosp., Plainfield	Not provided	2 yr.	Cert.	9	11	15	8	4	7	6	8
*Overlook Hosp., Summit	Not provided	2 yr.	Cert.	20	20	20	24	10	10	9	10
AREA 3											
Hunterdon County											
*Hunterdon Medical Center, Flemington	Not provided	2 yr.	Cert.	6	7	8	8	4	2	3	4
Mercer County											
*Helene Fuld Hosp., Trenton	Not provided	2 yr.	Cert.	16	16	16	18	5	5	7	5
*Princeton Hosp.	Mercer Co. Comm. Coll.-June 1973	2 yr.	Cert.	8	7	10	0	5	4	7	1
Mercer Co. Comm. Coll. (Beg. 6/73)	Hospitals: Hamilton, Mercer, Princeton, and Walson Army.	2 yr.	Assoc.	0	0	0	40	0	0	0	0
*Mercer Hosp., Trenton	Not provided	2 yr.	Cert.	10	5	6	0	7	4	6	6
*St. Francis Hosp., Trenton	Not provided	2 yr.	N/P	0	0	19	10	0	0	0	8

*Approved by the Am. Council on Med. Educ. of the AMA in collaboration with the Am. Coll. of Rad. and the Am. Soc. of Rad. Tech. 1972.

(2) Enrollment data for upper division only.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDEN-TIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
RADIOLOGIC TECHNOLOGISTS (Continued)											
Middlesex County											
*Middlesex County College, Edison	Hospitals: Kennedy, Perth Amboy, Rahway, St. Elizabeth's, St. Peter's, and Somerset.	2 yr.	Assoc.	24	46	53	63	0	0	13	20
Monmouth County											
*Monmouth Med. Ctr., Long Branch	Not provided	2 yr.	Cert.	0	14	10	12	3	4	0	11
Riverview Hosp., Red Bank	Not provided	2 yr.	Cert.	6	7	9	9	4	6	9	8
AREA 4											
Atlantic County											
*Atlantic City Hosp., Atlantic City	Not provided	2 yr.	Cert.	21	15	12	10	4	10	11	7
Burlington County											
*Burlington Co. Mem. Hosp., Mt. Holly	Not provided	2 yr.	Cert.	7	8	10	12	6	4	8	3
Camden County											
*Institue for the Advancement of Med. Sciences, Cherry Hill	Cherry Hill Medical Center	2 yr.	Cert.	6	5	9	10	4	1	5	3
*Cooper Hosp., Camden	Roentgen Ray Soc., Philadelphia	2 yr.	Cert.	14	17	22	20	7	7	7	7
*Our Lady of Lourdes Hosp., Camden	Not provided	2 yr.	Cert.	14	18	14	(1) 14	6	8	6	9
*West Jersey Hosp., Camden	Not provided	2 yr.	N/P	9	14	12	16	6	3	4	6
Cape May County											
*Burdette Tomlin Mem. Hosp., Cape May Ct. Hse.	Not provided	2 yr.	N/P	3	4	6	6	2	2	2	1
Cumberland County											
*Bridgeton Hosp., Bridgeton	Not provided	2 yr.	Cert.	6	6	6	3	3	3	3	3

* Approved by the Council on Med. Educ. of the AMA in collaboration with the Am. Coll. of Rad. and the Am. Soc. of Rad. Tech., 1972.

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDEN-TIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
RADIOLOGIC TECHNOLOGISTS (Continued)											
*Newcomb Hospital, Vineland	Not provided	2 yr.	N/P	1	0	7	8	0	0	1	3
RECREATION AIDES											
AREA 4											
Atlantic County											
Atlantic Comm. College, Mays Landing (Beg. 1/73)	Not provided	2 yr.	Assoc.	0	0	0	20	0	0	0	0
REHABILITATION ASSISTANTS											
AREA 3											
Middlesex County											
Middlesex County College, Edison	Not provided	2 yr.	Assoc.	93	108	141	170	17	22	18	24

*Approved by the Council on Med. Educ. of the AMA in collaboration with the Am. Coll. of Rad. and the Am. Soc. of Rad. Tech., 1972.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
RESPIRATORY THERAPISTS											
AREA 1											
Bergen County											
Alphonsus College, Woodcliffe Lake, (phase out courses June 1973)	Hospitals: Jersey City Med. Cntr., Overlook, St. Barnabas, and Valley.	2 yr.	Assoc.	11	32	69	0	0	0	0	24
Bergen Comm. Coll., Paramus	Hospitals: Barnert Mem., Bergen Pines, Hackensack, Pascack Valley, and St. Joseph's	2 yr.	Assoc.	0	0	30	52	0	0	0	0
AREA 2											
Morris County											
Fairleigh Dickinson Univ. Madison Campus (Beg. '73)	St. Claire's Hospital	2 yr.	Assoc.	0	0	0	6	0	0	0	0
AREA 3											
Monmouth County											
Brookdale Comm. Coll., Lincroft	Hospitals: Ft. Paterson, Freehold, Jersey Shore, Monmouth Medical, and Riverview.	2 yr.	Assoc.	(1) 2	(1) 11	(1) 41	(1) 41	0	0	0	6
AREA 4											
Atlantic County											
Atlantic Comm. College, Mays Landing	Not provided	2 yr.	Assoc.	10	14	22	18	2	5	6	7

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
RESPIRATORY THERAPIST TECHNICIANS											
AREA 1											
Hudson County											
Jersey City Med. Ctr., Jersey City	Alphonsus College	1 yr.	N/P	N/P	N/P	15	(1) 15	N/P	N/P	N/P	(1) 15
No. Hudson Hosp., Weehawken	None	12-18 mo.	Cert.	5	5	2	3-5	3	3	2	3-5
Passaic County											
Passaic Co. Coll., Paterson	Hospitals: Chelton Mem., Passaic Gen. Paterson Gen., St. Joseph's, St. Mary's	18 mo.	Cert.	0	0	9	30	0	0	0	0
AREA 2											
Essex County											
CMDNJ, Martland Hosp., Newark (Beg. 1/73)	Not provided	1 yr.	N/P	0	0	0	16	0	0	0	0
Mountainside Hosp., Montclair	Not provided	1 yr.	N/P	3	4	5	0	4	3	3	4
Newark Beth Israel Hosp., Newark	Not provided	6 mo.	N/P	2-4	2-4	2-4	0	4	3	3	0
St. Barnabas Med. Center, Livingston	None	4 mo.	Cert.	7	8	8	16	6	8	7	12
Morris County											
Dover General Hosp., Dover	No formal affiliations now	18 mo.	Cert.	0	4	4	5	0	1	4	2
Union County											
Alexian Brothers Hospital, Elizabeth	None	1 yr.	N/P	N/P	N/P	2	N/P	N/P	N/P	3	N/P
AREA 4											
Burlington County											
Burlington Co. Mem. Hospital, (Beg. 1/73)	Burlington Co. College	1 yr.	Cert.	0	0	0	6	0	0	0	0

(1) DHE/OHPE estimate.

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
RESPIRATORY THERAPIST TECHNICIANS (Continued)											
Camden County											
Institute for the Advancement of Med. Sciences	Cherry Hill Medical Center	2 yr.	Cert.	0	0	5	12	0	0	0	0
West Jersey Hosp., Camden	Not provided	1 yr.	N/P	0	4	4	8	0	0	4	4
SPEECH & COMMUNICATION AIDES											
AREA 4											
Atlantic County											
Atlantic Comm. College, Mays Landing (Beg. 1/73)	Not provided	2 yr.	Assoc.	0	0	0	20	0	0	0	0

OCCUPATION County and Institution	HOSPITAL/COLLEGE AFFILIATES	LENGTH	CREDENTIAL	FALL ENROLLMENTS				GRADUATES			
				70	71	72	Est. 75	70	71	72	Est. 73
SPEECH PATHOLOGISTS & AUDIOLOGISTS											
AREA 1											
Hudson County											
Jersey City State College, Jersey City	Not provided	4 yr.	Bacc.(2)	18	14	68	80	15	15	24	35
Passaic County											
William Paterson State College Wayne	North Jersey Training School	4 yr.	Bacc.(2)	69	58	100	90	31	32	30	18
		N/P	Mast.	19	17	17	25	8	9	9	17
AREA 2											
Essex County											
Montclair State College, Montclair	Not provided	4 yr.	Bacc.	39	N/P	127	N/P	N/P	1	34	N/P
		1 yr.	Mast.	19	N/P	N/P	N/P	N/P	16	13	N/P
Newark State College, Union	Not provided	4 yr.	Bacc.(2)	51	32	35	35	16	15	4	33
		N/P	Mast.	56	87	104	152	18	18	19	21
Seton Hall Univ., So. Orange	None	4 yr.	Bacc.(2)	0	0	8	20	0	0	0	8
		N/P	Mast.	0	0	8	17	0	0	0	8
AREA 3											
Mercer County											
Trenton State College, Trenton	Not provided	4 yr.	Bacc.	72	121	198	(1) 198	13	19	21	30
		N/P	Mast.	18	24	27	27	7	10	7	14
Middlesex County											
Douglass College, Rutgers Univ New Brunswick	Hospitals: Morristown Mem., St. Barnabas and St. Peters. Middlesex Rehab. Cntr., Rutgers Mental Health Cntr.	4 yr.	Bacc.(2)	63	59	63	96	33	30	29	34
		2 yr.+	Mast.	59	56	60	43	8	9	6	11

(1) DHE/OHPE estimate.
(2) Enrollment data for upper division only.

APPENDIX G

SUPPLEMENT TO APPENDIX E

ADDITION TO HEALTH MANPOWER DATA PROJECT

December 1972

TABLE 1

Combined Adjustment - Minimum Impact Legislation

CATEGORY	Supply				Demand			Differences (-Shortage)		
	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Veterinarians[1]	687	787	887	987	854	904	960	-67	-17	27
Respiratory Therapists	184	242	300	358	233	264	298	9	34	60
Speech Pathologists and Audiologists	390	427	467	511	444	482	517	-17	-15	-6
Cytotechnologists[2]	80	97	126	161	99	110	123	2	16	38
Medical Technologists[3]	900	1094	1330	1617	1095	1246	1462	-1	84	155

1. The demand projections for veterinarians have not been adjusted to reflect changes in health insurance legislation.

2. The base year for this group is 1972.

3. This health manpower occupational category includes persons certified as technologists in blood banking, chemistry and microbiology and cytotechnology.

TABLE 2

Combined Adjustments - Maximum Impact Legislation

	Supply				Demand			Differences (- Shortage)		
CATEGORY	1970	1975	1980	1985	1975	1980	1985	1975	1980	1985
Veterinarians[1]	687	787	887	987	854	904	960	-67	-17	27
Respiratory Therapists	184	242	300	358	251	285	321	-9	15	37
Speech Pathologists and Audiologists	390	427	467	511	456	496	540	-29	-29	-29
Cytotechnologists[2]	80	99	126	161	104	118	133	-5	8	28
Medical Technologists[3]	900	1094	1330	1617	1181	1344	1604	-87	-14	13

1. The demand projections for veterinarians have not been adjusted to reflect changes in health insurance legislation.

2. The base year for this group is 1972.

3. This health manpower occupational category includes persons certified as technologists in blood banking, chemistry and microbiology and cytotechnology.

VETERINARIANS

Veterinarians (doctors of veterinary medicine) diagnose, treat and control numerous diseases and injuries among many species of animals. Traditionally, they perform surgery on sick and injured animals and prescribe and administer drugs, medicines, serums and vaccines. Their work helps to prevent the outbreak and spread of diseases among animals. Because many animal diseases can be transmitted to human beings, this aspect of their work is vital to the public health. The number of veterinarians in the United States increased from 15,800 in 1950 to 26,971 in 1970. Of this total, 20,383 are members of the American Veterinary Medical Association.

A recent survey of the type of activity of AVMA members (Table 1) found that the majority of veterinarians are in private practice. Of those who are specialists, the greatest number treat small animals or pets. Some specialize in the health care of cattle, poultry, sheep, swine or horses. Many veterinarians inspect meat and poultry as part of the federal and state public health programs. Others are on the faculties of veterinary schools. Some veterinarians do research related to animal diseases, food and drugs; other veterinarians, as part of a medical research team, seek knowledge about the prevention and treatment of human disease.

Projected Supply

Future supply is forecasted by determining past trends in net increase in supply which incorporates the effect of attrition. Data presented in various issues of "Health Resources Statistics" indicates that New Jersey has increased its supply of veterinarians by an average of 20 per year.

In a study by Dr. David C. Tudor of the veterinary medical service for New Jersey, he found that there were 707 veterinarians in the state in 1971.[2]

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[2] David C. Tudor, V.M.D., Veterinary Medical Service in New Jersey and the Need for Veterinary Medical Education. (Mimeographed, 1972).

If we use the historical trend of 20 veterinarians per year as the basis of the supply projection, the expected increase in supply would be:

1975 - 787
1980 - 887
1985 - 987

Projected Demand

The demand for veterinarians is projected on the basis of population growth - thus, the demand for veterinarians is expected to be:

1975 - 730
1980 - 773
1985 - 821

Comparison of Supply and Demand

The forecasts of supply and basic demand indicate a surplus of veterinarians of 57 in 1975, 114 in 1980 and 166 in 1985.[3]

The demand for veterinarians was further adjusted to reflect current unmet needs. Based upon information presented in Dr. Tudor's study, a 17% unmet needs factor was used. The resulting demand and supply projections are presented in table 1, page G-2.

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[3] Dr. Tudor's forecasts differ from ours primarily because he adjusts for differences between New Jersey veterinarian population ratio of 9.8 per 100,000 population and the national average of 13.1 per 1000,000 population. Furthermore, our basic demand projections do not reflect an adjustment for current needs.

TABLE 1

Type of Activity of Members of the American Veterinary Medical Association December 31, 1970[1]

Type of Activity		Number	Percent
Total Respondents		19,440	100.0
Private Practice		14,197	73.0
Large Animal	6.9%		
Small Animal	29.5%		
Mixed	36.6%		
Regulatory Veterinary Medicine		925	4.8
Veterinary Public Health		266	1.4
Military Veterinary Services		902	4.6
Other		2,888	14.8
Retired		262	1.4

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[1] Department of Health, Education and Welfare, "Health Resources Statistics, 1971." (Washington, D.C.: Government Printing Office, 1971) p. 72.

MEDICAL LABORATORY WORKERS

Laboratory tests play an important part in the detection, diagnosis and treatment of cancer, tuberculosis, diabetes, meningitis and other diseases. Medical laboratory workers, often called clinical laboratory workers, include three levels: medical technologists, technicians and assistants.

A Board of Registry of Laboratory Technicians was established in 1928 by the American Society of Clinical Pathologists (ASCP). For a time, this Board certified two general categories of laboratory personnel - laboratory technicians and medical technologists. In 1936, it was decided to drop the term "laboratory technician" and certify all generalists as "medical technologists." Accordingly, the name of the registry was changed to the Board of Registry of Medical Technologists.

Within the past five years, two other generalists classifications - certified laboratory assistant and medical laboratory technician - have been developed to define other levels of personnel employed in today's clinical laboratory. In addition, the Board of Registry has developed categorical certification in blood banking, chemistry, microbiology, hematology, nuclear medicine technology, cytotechnology and histologic techniques.

MEDICAL TECHNOLOGISTS MT (ASCP)

A medical technologist performs chemical microscopic and bacterialogic tests to provide data for the use in treatment and diagnosis of disease. He receives specimens from laboratories and obtains body materials and tissues from patients and makes qualitative and quantitative chemical analysis.

A medical technologist is required to complete a four year college or university program including a clinical education component approved by the Council on Medical Education of the AMA. Such a program should be conducted so that the baccalaureate degree requirements of the academic institution are fulfilled. Requirements in the preclinical preparation include 16 semester hours of chemistry, 16 semester hours of biological science and one semester of mathematics.

National certification examinations given by the Board of Registry of Medical Technologists enables persons with the above education, or individuals with a baccalaureate degree and five years of experience in the clinical laboratory to use the professional designation MT (ASCP).[1]

Projected Demand

The major difficulty in assessing the manpower situation for medical technologists is that the available data does not permit us to distinguish between those persons who are medical technologists and those persons who are technologists in the subspecialities of blood banking, chemistry, microbiology and cytotechnology. It was therefore decided to develop demand projections for the entire group since they must all meet the same minimal levels of education.[2]

A survey conducted by the New Jersey Society of Medical Technologists[2] found that there were 1200 certified medical technologists in the state in 1969. It was assumed that three-quarters of that total, or 900 medical technologists were actively employed in 1969.[3] This figure was then used as our base year.

The future demand for this health manpower category is determined by projecting the increase in the demand for hospital services due to increases in income and population growth and the interaction effect between income and population - thus, the projected demands are:

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[1] Department of Labor, Dictionary of Occupational Titles, 1965. (Washington, D.C.: Government Printing Office, 1966) p. 200 and Department of Health, Education and Welfare, Health Resources Statistics, 1969 (Washington, D.C.: Government Printing Office, 1970) p. 56.

[2] The exception is cytotechnology which requires a 2 year degree. Separate projections have been made for this group.

[3] The Department of Health, Education and Welfare reported that 75% of all registered medical technologists were actively employed in 1966. See: Health Resources Statistics, 1970, p. 58.

1975 - 1016
1980 - 1156
1985 - 1302

Supply Projections

We were not able to determine the historical trends in supply in the State because our data was available for only one year; however, it was assumed that the historical data for the nation as a whole might provide us with a base for calculating the growth rate for New Jersey.

National data published in various issues of Health Resources Statistics indicated an average rate of growth of 8% per year between 1965 and 1971. We believed however that this rate of growth was unlikely to continue into the future and a more reasonable rate of growth of 4% was assumed. Based upon this assumption, the projected supply of medical technologists would be:

1975 - 1094
1980 - 1330
1985 - 1617

A comparison of the basic demand projections and the supply projections indicate that a growing surplus of medical technologists is expected. The calculated surpluses are: 78 in 1975, 174 in 1980 and 315 in 1985.

Demand is further adjusted to reflect current unmet needs. Using the HEW publication, Survey of Health Manpower in Hospitals, it is determined that the unmet needs factor for this HMOC is 6%. The projected demand now becomes 1077 in 1975, 1225 in 1980 and 1380 in 1985. The projected surpluses are 17 in 1975, 105 in 1980 and 237 in 1985.

A final adjustment to demand is made to reflect the minimum impact of national health insurance (estimated at 1.7% for the proposed Administration Bill) and the maximum impact of national health insurance(estimated at 9.7% for the proposed Kennedy Bill). The results of these projections are presented in tables 1 and 2, pages G-2-3.

MEDICAL LABORATORY TECHNICIANS

"Medical Laboratory Technicians are a new level of laboratory personnel. These technicians usually work under the supervision of the medical technologist, performing at a level between the medical technologist and the certified. Certification is awarded by the board of Regiatry of the ASCP following the successful completion of an examination. Requirements for certification include either an associate degree from a junior college or community college plus supervised training in a clinical pathology laboratory or graduation from a 12-month military laboratory program with an associate degree or its equivalent."[1]

Supply and Demand Projection

Data on the number of people in the health manpower occupational category could not be obtained and therefore, projections of supply and demand were not made.

It is hoped that once the results of a survey of laboratory personnel conducted by the American Society of Medical Technologists becomes available, projection can be made for this and other manpower categories.

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1. Department of Health, Education and Welfare. Health Resources Statistics, 1969, (Washington, D.C.: Government Printing Office, 1970) p. 57.

CYTOTECHNOLOGIST

A cytotechnologist is one who stains, mounts and studies cells of the human body to determine pathological conditions. He also examines specimens and diagnoses the nature and the extent of disease or cellular damage by performing a variety of laboratory tests.[1]

A cytotechnologist receives his training in schools of cytotechnology approved by the AMA Council on Medical Education in collaboration with the American Society of Clinical Pathologists and American Society of Medical Technologists through the Board of Schools (ASCP).[2]

"Minimum educational prerequisites include 2 years of college with 12 semester hours in science, eight of which are in biology. The cytotechnology course provides for 6 months of education, plus 6 months full-time experience in an acceptable cytology laboratory...Successful completion of national certification examination given by the Board of Registry of Medical Technologists permits use of the designation CT (ASCP)."[3]

Projected Demand

The only available source of data on the number of cytotechnologists in New Jersey can be found in a 1972 survey conducted by Mr. Charles E. Thompson of Mountainside Hospital for the New Jersey Cancer Society. Mr. Thompson surveyed 105 cytotechnicians and of the 62 that responded, it was found that 2 were students, 2 were employed out of state, 11 were unemployed and 47 were employed within the state.

For the purpose of projecting demand, it was assumed that the 105 cytotechnologists constituted the entire population of cytotechnologists in the state.

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1. Department of Labor, Dictionary of Occupational Titles, 1965. (Washington, D.C.: Government Printing Office, 1965) p. 188.

2. Health, Education and Welfare. Health Resources Statistics, 1970. (P.H.S. Bulletin No. 1509, Washington, D.C.: Government Printing Office, 1971) p.56.

3. Ibid.

It was further assumed that 6% of the total surveyed were unavailable for employment and that 19% of the remaining available population (105 less 6%) of cytotechnologists were inactive.

The projected demand for cytotechnologists is based upon expected increases in hospital usage due to increases in population and income and their interaction effect - thus, the basic demand projection are the following:

1975 - 86

1980 - 98

1985 - 110

Projected Supply

Initially, it was believed that supply could be projected on the basis of national growth trends; however, this approach was rejected because it was doubtful that a growth rate of 15% could be sustained. It was therefore assumed that between 1972 and 1975, the growth rate would be 7½% per year and 5% per year during each of the remaining projection periods.

The above assumptions resulted in the following supply projections:

1975 - 99

1980 - 126

1985 - 161

Comparisons of Supply and Demand

The projections indicate that a surplus of cytotechnologists would exist in each of the following projection periods. The surpluses are expected to be:

1975 - 13

1980 - 28

1985 - 51

Demand is further adjusted to reflect current unmet needs. Using the HEW publication, Survey of Health Manpower in Hospitals, it is determined that the unmet needs factor for this HMOC is 10%. The projected demand now becomes 95 in 1975, 108 in 1980 and 121 in 1985. The projected surpluses now become 4 in 1975, 18 in 1980 and 40 in 1985.

A final adjustment to demand is made to reflect the minimum impact of national health insurance (estimated at 1.7% for the Administration Bill) and the maximum pimpact of national health insurance (estimated at 9.7% for the Kennedy Bill). The results of these projections are presented in tables 1 and 2, pages G-2-3.

RESPIRATORY THERAPISTS AND TECHNICIANS

"Inhalation therapy is an allied health specialty in the treatment, management, control and cure of patients with defficiencies and abnormalities associated with the process of breathing.

The inhalation therapy specialist must be expert in the therapeutic uses of such aids to the breathing process as medical gases, oxygen administering apparatus, humidification, aerosols, positive pressure ventilation, chest physiotherapy, cardiopulmonary resuscitation and mechanical airways.

"Inhalation therapy is used primarily in the treatment of heart and lung ailments, such as cardiac failure, asthma, pulmonary edema, emphysema, cerebral thrombosis, drowning, hemmorrhage and shock.

"Noting the many uses of inhalation therapy, 'Hospitals', the journal of the American Hospital Association, states: 'The demand for inhalation therapy is great, because its therapeutic and diagnostic procedures apply to young patients as well as to old, to the acutely ill as well as to the chronically ill, to ambulatory outpatients as well as to bed-fast inpatients, and in fact, to patients in every department of the hospital.'

"The rapid increase in the technical complexity and variety of inhalation therapy used in patient care has resulted in two general classifications of specialists - inhalation therapist and inhalation therapy technician. Both specialists must be fully capable under medical supervision, of administering to patients the therapeutic and diagnostic procedures of inhalation therapy and of cleaning, sterilizing and maintaining inhalation therapy equipment. Based on his advanced educational background, the inhalation therapist is given greater responsibility in patient care, teaching, research, departmental supervision and the development of the field of inhalation therapy.

"Registration of the inhalation therapist by the American Registry of Inhalation Therapists Incorporated means official recognition or competency. A therapist is required to have a high school education, be a graduate of a qualified school of inhalation therapy and have clinical experience.

"In September 1970, the American Registry of Inhalation Therapists began to require that candidates who wish to qualify as registered therapists must have two years of college which may be taken concurrently with the candidate's inhalation therapy training.

"An inhalation therapy technician is certified by the Technician Certification Board of the American Association for Inhalation Therapy. A technician may qualify with on-the-job training under medical supervision."[1]

Projected Supply

Because there appears to be a great deal of confusion over the employment roles of the therapist and the technician, it was decided that a single projection for both therapist and technician combined would be made.

The supply of respiratory therapy personnel was projected from data taken from two sources. The Directory of American Registry of Inhalation Therapists, Incorporated reported that the number of registered therapists increased from 14 in 1969 to 18 in 1972. The American Association for Respiratory Therapy reported that there were 208 active therapists and technicians as of September 1972.[2]

It was assumed that the ratio of registered therapists to total personnel would remain constant at 8.7% (18/208) during each of the projection periods. It was further assumed that the number of registered therapists would increase by five during each five year period. These two assumptions implied that the net increase in supply would amount to 58 (5/.087) during each period. Therefore, the projected supply of respiratory therapists and technicians would be:

1975 - 242
1980 - 300
1985 - 358

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1. "American Association for Inhalation Therapy,...Considering a Career in Inhalation Therapy?"
2. Based upon data in the Directory of American Registry of Inhalation Therapists, Inc.

Projected Demand

The demand for respiratory therapists and technicians is projected on the basis of expected increases in hospital days due to increasing income and population growth and their interaction. The projected increases in demand are:

1975 - 208
1980 - 236
1985 - 266

Supply and Demand Comparison

Comparing the supply and the basic demand projections, a surplus of 34 in 1975, 64 in 1980 and 88 in 1985 is expected.

Demand is further adjusted to reflect current unmet needs using the HEW publication, Survey of Health Manpower in Hospitals, it is determined that the unmet needs factor for this HMOC is 10%. The projected demand now becomes 229 in 1975, 260 in 1980 and 293 in 1985. The projected surpluses now become 13 in 1975, 40 in 1980 and 65 in 1985.

A final adjustment to demand is made to reflect the minimum impact of national health insurance (estimated at 1.7% for the proposed Administration Bill) and the maximum impact of national health insurance (estimated at 9.7% for the proposed Kennedy Bill). The results of these projections are presented in tables 1 and 2, pages G-2-3.

SPEECH PATHOLOGISTS AND AUDIOLOGISTS

Speech pathologists and audiologists are concerned with disorders in the production, reception and perception of speech and language. They help to identify persons who have such disorders and to determine the etiology, history and severity of specific disorders through interviews and special tests. They facilitate optimal treatment of speech, hearing and language difficulties through remedial or conversational procedures, counseling and guidance. They also make appropriate referrals for medical or other professional attention.

Speech pathologists are concerned primarily with speech and language disorders and audiologists with hearing problems. Speech and hearing however, are so interrelated that to be competent in either of these occupations, one must have a familiarity with both. The speech pathologist works with children and adults who have speech, language and voice problems resulting from brain injury, cleft palate, mental retardation, emotional problems, foreign dialect, or other causes. The audiologist also works with children and adults but concerns himself primarily with the assessment and treatment of hearing problems such as those caused by certain otological or neurological disturbances.

The duties performed by speech pathologists and audiologists vary with their education, experience and employment setting. In a clinical capacity, they identify and evaluate speech and hearing disorders using various diagnostic procedures. This is followed by an organized program of therapy, with the cooperation of other specialists, such as physicians, psychologists, physical therapists, counselors, and teachers.

Projected Demand

The demand for qualified pathologists and audiologists is expected to increase through the 70's. Many speech pathologists and audiologists will be needed annually through the 70's to staff new or expanding programs in schools,